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Johnstown, PA 15905

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Introduction

The Military Interoperable Digital Hospital Testbed (MIDHT) is a five-year program of research to develop a real-world testbed environment in Southwestern Pennsylvania. The purpose is to research and evaluate Health Information Exchange (HIE) and health information technology (HIT) and services (HITS) that make health information readily available to consumers and providers. Ideally this will allow for the secure transfer of information between private sector rural providers, federal partners and patients. MIDHT will also define requirements and solutions to optimize healthcare resources for rural communities and identify lessons learned and best practices that benefit both the global MHS environment and stakeholders in the region. The Department of Defense (DoD) and Conemaugh Memorial Medical Center (CMMC) have common requirements for HIE, connecting disparate systems and providers and enabling secure provider-provider and provider-consumer e-communications. Minimal evidence is available on what business, clinical and technical solutions can be used to overcome the lack of specialists, infrastructure and geographical barriers associated with the delivery of care in rural communities.

CMMC hosted a site visit for Dr. Steve Steffensen and Betty Levine from the Telemedicine and Advanced Technology Research Center (TATRC) on 9 June 2011 in Johnstown, Pennsylvania. A physical tour of the pharmacy robotics system was completed in addition to a live demo of the health information exchange using the CONNECT 3.1 software. Great strides have been made since their visit in June. Northrop Grumman Corporation is an integral subcontractor for the HIE deliverables.

Arm 1. The Impact of Medication Dispensing/Administration Technology Within a Rural Healthcare System.

In order to improve efficiency and safety of medication dispensing and administration, a complementary set of health information technologies are being implemented. A centrally managed pharmacy robotics system has been implemented at the tertiary care facility, CMMC. Many of the medications ordered for use on inpatient floors are currently dispensed by the Robot Rx°. Bar coded medications are now administered at the bed side on three pilot floors, accompanied by an electronic medication administration record (eMAR). Research objectives focus on medication errors, provider workflow, provider satisfaction and related financial data.

Arm 2. Health Information Exchange (HIE) via the Nationwide Health Information Network (NwHIN).

Building upon work completed in previous phases, CMMC continued efforts on health information exchange using the NwHIN standards and specifications. In order to update our HIE environment, open-source version CONNECT 3.1 (www.connectopensource.org) was deployed and integrated with existing functionality. Important milestones have included

patient discovery with Initiate Master Patient Index, restructuring of xml consistent with the HITSP C32 specification, integration of emergency room discharge summaries in HITSP C62 format and completing NwHIN conformance/interoperability testing with the Office of the National Coordinator for Health IT (ONC).

Body

Subtask 1.1 Implement pharmacy robotic technology and bar-coded enabled medication administration (BCMA) in an acute hospital system setting.

Pharmacy Robotics Implementation

During the last quarter, the Robotic automation effort was fully deployed for CMMC and Meyersdale Medical Center (MYMC). Fulfill-Rx automated re-ordering training and operational status went live on August 30, 2011. Numerous equipment-related, workflow-related, and training-related issues came to light as more nurse stations came on board with the new process.

Equipment issues were particularly troublesome and created challenges for the pharmacy staff. These issues included the filling speed and location of stat orders, repackager inconsistencies and applicability to certain medications, suction issues with the robotic arm that result in dropped (missing) medications, and increased noise levels. Weekly support calls were held and several field adjustments were made by the vendor on both the Robot and MedCarousel. Performance and uptime improved incrementally during the period. By September 27, 2011, all but a handful of issues remained outstanding. One area of continued concern is the envelope delivery system, or EDS. This is the mechanism whereby the Robot places picked meds into patient-specific cardstock envelopes for transportation to the nursing station. The EDS will sporadically mis-function and cause some medications to miss the envelope. The vendor has improved the process via equipment adjustments, but reliability issues remain at the time of this report. Reliability of the EDS is the only remaining unresolved high-priority issue.

Unanticipated workflow issues for nursing came to light as the new process was rolled out. One in particular was the continuation of previous habits. The previous decentralized medication distribution model required nursing to pull all patient medications from automated dispensing cabinets (ADC's) located on each nurse station. During the project planning phase, it pharmacy decided to leave the medications in the ADC's as a precaution in the event the new centralized distribution process had problems. Pharmacy discovered that nursing was continuing to pull all their medications from the ADC instead of from the envelopes. The correct process is to pull only narcotics from the ADC, since all other medications are to be in the envelope. This resulted in envelopes being returned to the pharmacy full of medications and requiring manual crediting to the patient's account. The issue was exacerbated by the fact that the bar code medication administration (BCMA) process was not yet deployed and nursing did not have the new carts in place to house the medications sent from the pharmacy.

Pharmacy has addressed the issue by providing additional education to nursing and by removing the scheduled meds from the ADC's so that nursing must use the envelopes. Anecdotal concerns exist from nursing as they need to empty envelopes before placing specific medications into drawers on the mobile medication carts.

A second workflow issue involves hours of pharmacy operation. Under the decentralized model, night-shift was a slow time with minimal activity other than off-hours order processing. This changed in the new Robot-driven centralized workflow model. Pharmacy has learned that they need to utilize the midnight shift to perform cart fill so that the envelopes for the next day can be delivered to Nursing in the early morning. This change has required a review of staffing so that additional staff is scheduled for the midnight shift. Plans for this change have been approved. Implementation will occur as soon as staff schedules can be filled.

A final operational issue involves the capacity of the automation system. We have learned that, even with optimization efforts, the combined capacity of the Robot and MedCarousel are not sufficient to meet the needs of Conemaugh's operations. A re-budget request is currently being developed to address this issue by adding a second MedCarousel. Major tasks for next quarter are to move all Robot fill to night shift and continue to smooth out operations associated with workflow and the BCMA rollout. Please see Appendix A for pictures of the equipment.

Bar Code Medication Administration (BCMA) Implementation

October - December 2010

Executed contract with McKesson for Admin Rx project

<u>January – March 2011</u>

- Vendor and internal project managers assigned
- Nursing champions identified to assist in workflow design
- AdminRx project kick-off conference call with vendor conducted on March 14, 2011

April – June 2011

- Build training of MIS and pharmacy staff
- Wireless infrastructure assessed, recommendations made
- MIS and pharmacy staff completed AdminRx on-line education
- Continued with AdminRx System build
- Carelink interface migration for training and QA environments
- Device evaluation continued

July - September 2011

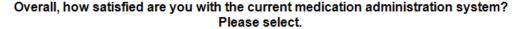
- McKesson Implementation Team visit to begin bar code verification
- Citrix environment testing
- Development of user training material
- Training schedules completed
- Set-up and tested AdminRx reports to Horizon Patient Folder
- Table copied from facility 01 to facility 02
- Continued bar code verification
- Device selection finalized and initial equipment order initiated
- End user training began 4 hour classroom session with hands-on practice
- End user training continued
- Training of Super User Support Team, which consists of 10 nurses loaned to MIS by nursing to assist in AdminRX rollout. These 10 nurses received 40 hours of classroom training by MIS project team experts
- Go-live planning
- Device configuration and testing
- Pilot units Ashman 7, Rose 7 and Cardiac Intensive Care Unit (CICU) live on 09/27/2011

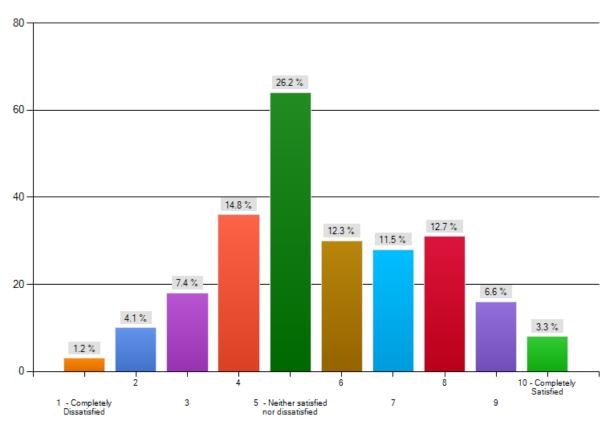
Please refer to Appendices B and C for Admin Rx training materials.



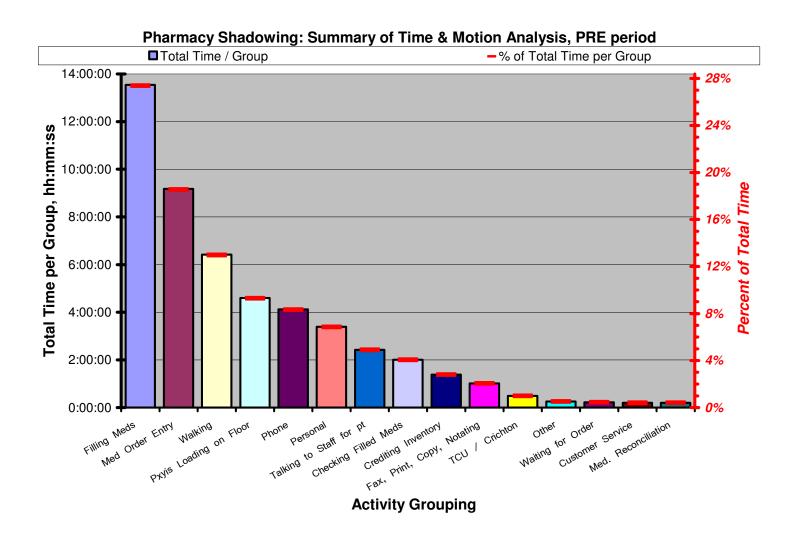
Subtask 1.2 Research and analyze the resulting technological impact on medication errors, pharmacist productivity, nurse satisfaction/workflow and patient satisfaction.

The Medication Administration System-Nurses' Assessment of Satisfaction (MAS-NAS), developed by Hurley et al at Brigham and Women's Hospital, was made available through various means to all CHS inpatient nurses in early April. The response from stakeholders has resulted in 262 acceptable surveys, an approximate response rate of 38%. The column chart below depicts nurse satisfaction with the current medication administration system (baseline). As depicted, 46% of respondents are satisfied with the current system. This presents a real opportunity to improve nursing satisfaction through the pharmacy robotics and bar code medication administration implementation. The survey has been closed for CMMC and rural MYMC inpatient nurses but remains open for nurses at Miners Medical Center (MIMC). Union negotiations at MIMC have been a barrier to receiving additional responses from that site.





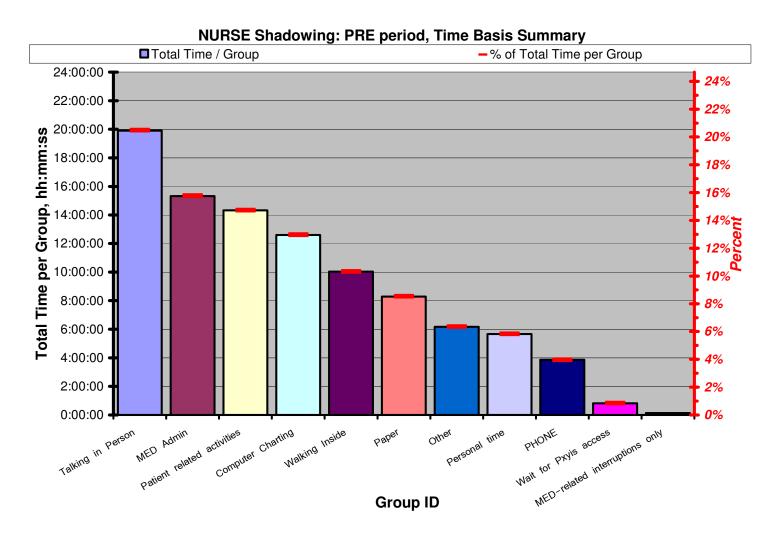
The research team conducted 12 baseline time and motion observations of CMMC pharmacy staff during the month of April 2011. Each staff member was typically shadowed for a continuous 4-hour period. Varying shifts were selected to create a representative sample. As depicted below in the column chart, approximately 27% of the time was used to fill medication orders. The next four most time consuming activities were medication order entry by pharmacists (18%), walking in the department or throughout the hospital (13%), loading medications into Pyxis machines (9%), and talking on the phone to hospital staff (8%). A similar effort will be conducted during a stabilized state, post implementation of the pharmacy automation system.



Baseline data has been collected for the following items:

- Medication Error Reports (by type, severity, quantity, and location)
- Non-returnable, expired medications and associated cost
- Annual drug expenses and ending inventory for 3 hospitals
- Number of bar-coded medications sent by courier to MYMC

Time and motion observations of nursing staff have been completed at CMMC and MyMC for the baseline period. Twenty seven (27) RN's and LPN's from various locations were typically shadowed for a continuous four-hour period during peak medication administration times. Preliminary data was reviewed and summarized below. As depicted, talking to patients and staff in person was the most frequent activity at 23% of the time. The second highest activity was medication administration at 17% of the time, followed by patient related activities (e.g. patient assessment/assistance) (16%), computer charting (14%) and walking inside (11%). Additional sessions at the rural MIMC are being scheduled (according to sufficient patient volume).



Conclusion

Pharmacy automation and bar code medication administration implementations have occurred on schedule despite various challenges noted in the report. Extension of the technology to Miners Medical Center will occur during the next year. Post implementation research will be integral to assess the impact of said technologies on cost, provider workflow, patient safety and stakeholder satisfaction.

Subtask 2.1 Deploy a limited production, NHIN standards-based HIE focusing on the bi-directional exchange of electronic medical records between CHS and the Military Health System. CHS information to include data domains residing in acute care and ambulatory settings.

CMMC and Northrop Grumman Corporation (NGC) have worked closely to design and implement a standards-based health information exchange using the five core NwHIN specifications, which include patient discovery, document query, document retrieve, messaging and authorization. NGC led migration efforts to CONNECT 3.1 from CONNECT 2.1. This was done in order to stay current with releases. The activities below represent NGC software development during various cycles throughout the year.

Northrop Grumman Corporation Activities

Cycle 1 (October 2010 – January 2011)

- 1.1. Dynamic Document Assembler CONNECT Plug-in did not work "out of the box"
 - Two web services (AdapterDocQuerySecured and AdpaterDocRetrievedSecured) required updates to match the new WSDLs in CONNECT v3.1
 - Hibernate code needed to be redirected to point to local configuration files
 - Document Manager web service had to have several endpoints condensed to eliminate "dispatch" errors
- 1.2. Support Module/Marital Status updates to Document Assembler
 - Added support module to C32.
- 1.3. Updated style sheet to include Support Module information
 - Added Support Module (Contact Information) to the CMMC C32 style sheet.
- 1.4. Medication Header
 - The header for the medications section of the C32, as displayed in the Inbox, was changed to read "Medications" instead of "Allergies".
- 1.5. SIG Field
 - Under the Medications section, a value now displayed under the "Sig" column for each medication.
 - Valid values are a series of asterisks (*) if a Sig value is not available from Allscripts or test data that describes the medication entry.

- 1.6. Configured NG Clinical Viewer to work with CONNECT v3.1
 - Reconfigured Clinical Viewer/Front end to work in 3.1 environment.
- 1.7. Allergy Reaction field not displaying all reactions in the xml file
 - Added functionality to CMMC style sheet to render multiple Allergy reactions.
- 1.8. Implemented document assembler changes for onset date within Allergies and Problems
 - Updated Document Assembler to populate the <text> field in the C32 with the parsed <text> field from the CareRecord for Allergies and Problems (parsed the date information from the text field).
 - Updated the CMMC style sheet to display the <text> field if the effectiveTime field was not populated.
- 1.9. Incorporated base inbox code
 - The UniversalClientGUI, which is available with CONNECT v3.1, has been patched to work with the updated document assembler code and CONNECT v3.1 base code.
- 1.10. Resolved locating patients in the Gateway MPI as per v3.1 patient consent
 - Enables the ConsumerPreferencesProfileGUI to look up patients in the CONNECT default MPI.
- 1.10 Checked Property Files into Subversion that are already configured for CMMC and "Other" (TATRC) endpoints.
 - Updated configuration files currently checked in source control to be configured to work with CMMC.
 - Copies of the CMMC versions were checked into source control under the following convention *- CMMC.
 - Copies of original files were also checked into source control under the following convention *- ORIGINAL. Files affected: adapter.properties, adapter_common_datalayer.properties, gateway.properties, internalConnectionInfo.xml, docassembly_dll.sql.
- 1.11 Resolved the persistence issues within the patient consent module v3.1
 - Opt-in/Opt-out consumer consent choices are now persisted.

Cycle 2 (February – May 2011)

- 2.1 Created WSDL for Emergency Room Discharge Summary
 - The CAL WSDL was updated and provided to CMMC as part of the overarching Emergency Room (ER) Discharge Summary tasking.
- 2.2 Enhanced inbox to support unstructured document type (C62)
 - Inbox was modified to display the contents of a C62 document. In addition, static references to the C32 document were removed from the GUI's code.
- 2.3 Added line to the docassembly database script to add the document type for ER Discharge Summaries. This script is run during the install.
- 2.4 CONNECTUniversalClientGULSAML errors
 - This update addresses the issue that is encountered when the user tries to search for a patient from the mpi.xml file using the CONNECTUniversalClientGUI application. Specifically, adding the appropriate xml files to the src\main\java\META-INF folder and updating the wsit-client.xml file to reflect that the missing files were added solves this issue.
- 2.5 Updates to CONNECT Universal Client GUI
 - This update allows the user to choose targeted gateways via a combo box that appears under both the patient discovery and document query tabs. This update also dynamically chooses a style sheet to render a document against, based on the OID of the responding gateway.
- 2.6 Corrected AdHocQuery Status Slot
 - This update corrected the entry status slot value in the Document Query request. The value was updated from "urn:oasis:names:tc:ebxmlregrep:ApprovedStatusType:Approved", which was the default value in the CONNECT GUI, to "urn:oasis:names:tc:ebxml-regrep:StatusType:Approved".
- 2.7 Participant Module is constructed even if no patient demographic information is available
 - Corrected the construction process of the participant module such that it only occurs if patient demographic information is available.
- 2.8 C32 still being returned even when no patient information from Allscripts is returned.

- Completed updates to handle the situation when no patient demographic information is stored in Allscripts. An empty document (C32) was being returned, and is displayed in Inbox. When viewed, the document had no information.
- 2.9 Updated Information Source Module to include address and phone number
 - Updated Information Source Module to include address and phone number in C32's
- 3.0 Multiple items returned from Initiate
 - Modified the Initiate Connector to parse the Initiate response in the event that multiple patients are returned with the same EID. Response returned contains the most updated patient entry per EID.
- 3.1 Modified the Initiate Connector to include the recStatFilter within the Initiate request.
- 3.2 Modified the Initiate Connector to include middle name in a given tag.
- 3.3 Implemented Spring Injection points in CONNECT v3.1 framework for Patient Discovery
 - Spring Injection points now allow for one of four selectable implementations for every service in CONNECT v3.1 framework for Patient Discovery
- 3.4 Patient Discovery Responding side to Initiate
 - Allows a patient discovery request from a remote gateway to pass through the CHS Gateway and adapter, then on to Initiate, where a patient lookup is performed, and the results are passed along to the requestor. This external search allows at most one patient, and a high threshold (minScore) to be sent to Initiate. Also, internal patient search has been enhanced to use the same flow through, with different rules (allows multiple returns, sets different min score (lower threshold) to Initiate)
- 3.5 Patient Discovery Initiating side to Initiate
 - Changes were made to the CONNECTUniversalClientGUI in order to facilitate the building of a Patient Discovery Request that can be sent to all configured gateways or to targeted gateways. In support of the target gateway functionality, a textbox was added under the Patient Discovery tab. This textbox allows users to input the OIDs of target communities. In addition to the updates that were made to the GUI code, updates were also made to the interactionId value that is contained within the CHSCoreLib and CONNECTCoreLib projects. The change updates the value to reflect the actual

- type (PRPA_IN201305UV02 instead of PRPA_IN201305UV) of the request that is being sent out.
- 3.6 Modified Patient Discovery Response to be compliant with Patient Discovery Specification
 - This modification enhanced the response created by the Initiate Connector by making it Patient Discovery schema compliant
- 3.7 Returned PRPA_IN201306UV02 (Patient Discovery Response) does not pass Schema Validation
 - Updated PRPA_IN201305UV02 (Patient Discovery Response) to pass schema validation
- 3.8 Patient Discovery Response is Missing "asAgent" Tags
 - Added missing "asAgent" section to the Patient Discovery response created by the CHSCoreLib
- 3.9 Investigated and fixed as required the SAML attributes generated in the SOAP headers of messages from the CHS gateway
 - This incident updated the values presented in the SAML header, from the CMMC Gateway, to acceptable values for ONC Conformance testing. The SAML header identifies, in a secure way, the person/party making a request on the NHIN.
- 4.0 All items in response from Initiate are not NwHIN Patient Discovery specification compliant
 - Format of suffix, DoB, and telephone number fixed in the Patient Discovery Response to be NwHIN Patient Discovery specification compliant
- 4.1 Patient Discovery Response is Missing "queryByParameter" Tags
 - This update adds the missing queryByParameter section to the response created by the CHSCoreLib
- 4.2 Patient Discovery needs to support Address1 and Address2 lines
 - Modified the createPatientPerson method within INITIATEtoCAL.java to allow for multiple street address tags.
- 4.3 Patient Discovery Telephone Numbers do not match specification (RFC 3966)

- This update added the country code to the Patient Discovery Response to make phone numbers schema compliant
- 4.4 Added Social Security Number (SSN) to Patient Discovery Response

Cycle 3 (June – July 2011)

- 1.0 Added functionality to the Document Assembler to allow for handling of multiple Emergency Room Discharge Summaries (C62's)
 - Enhanced the Document Assembler to be able to assemble (query and retrieve) multiple C62 documents, for a single patient.
- 1.1 Updated CONNECT Universal Client GUI Inbox to allow for display C62's
 - The existing VLER Inbox code has been incorporated into the CONNECTUniversalClientGUI so that C62documents can be rendered.
- 1.2 C62 documents are not returned during a query if a C32 document is requested (based on class code)
 - Code modified to enforce class code sent in request for all applicable documents.
- 1.3 Gateway shall correctly respond to failed retrieve document requests
 - Correct document retrieve error codes now appear in document retrieve response messages per specification.
- 1.4 EntityDocRetrieve interface always returns RegistryResponse status of success
 - The message success and failure codes for messages sent out through the EntityDocRetrieve interface are now correct.
- 1.5 Document Assembler does not handle concatenated XDSDocumentEntryClassCode
 - When an incoming docQuery request is retrieved, the code will be parsed so that only the class code is used.
- 1.6 Updated CONNECT Universal Client GUI document search page
 - The current date fields in the CONNECTUniversalClientGUI have been modified to work off of service dates rather than creation dates. The "Earliest Date" now represents the Service Start Time From and the "Most Recent Date" now represents the Service Start Time To value.

- 1.7 Updated document assembler to handle or ignore service dates based on document type
 - Updated document assembler code to honor service times received in a document query request from remote gateways specific to C62's
- 1.8 Document Query mishandling service times and class codes
 - Corrected the enforcement of the Class Codes within the document assembler.
- 1.9 Modified the outgoing document query to send specific class code
 - A combo-box control was added to the Documents tab of the CONNECTUniversalClientGUI which allows a user to query for the document types of their choice. When no values are chosen from the combo-box, all document types will be queried for and a ClassCode slot value will be excluded from the Document Query request.
- 2.0 Modified the document query request to use the proper DocumentEntryStatus code
 - The CONNECTUniversalClientGUI now generates a document query request that contains the status types of both "Approved" and "DeferredCreation"
- 2.1 Modified the system to filter based on status type
 - A doc query response message indicating no documents found will be sent when the \$XDSDocumentEntryStatus value is NOT Approved.
- 2.2 Investigated enforcement of Opt-In/Opt-Out for Patient Consent
 - When Patient Consent is configured to support the Opt-In/Opt-Out enforcement, this code will block all requests for data for any patient who has "Opted Out" or who has not made an Opt-In or Opt-Out selection. Data will be returned only for those patients who have made an Opt-In choice and had their choice stored in the document database in their Consumer Preferences Profile (CPP) document.
- 2.3 Updated format codes contained in metadata for C32 and C62
 - Updated the document assembler to read the metadata configuration values from a property file, docassembly.properties, instead of from the database, das_config table. This allows for different values to be used for different document types. Also, updated metadata values for both C32 and C62 document types and the class code from 59258-4 to 18842-5 for Discharge Summaries based upon VLER communications.

- 2.4 Document Assembler mishandling meta-data for multiple documents/document types
 - Corrected the handling of meta-data when multiple document types and /or multiple C62's are involved.

Cycle 4 (August 2011 - Present)

- 1.0 Resolved all errors returned when a CMMC C62 document is validated against the Lantana testing tool.
- 1.1 Fixed the caching functionality of the CMMC Document Assembler so that multiple copies of the same C32 and C62 documents do not get created and stored within the document repository.
- 1.2 Made CPP GUI active and ready to perform Opt-in and Opt-out procedures. Also, removed the fine-grain controls from the GUI and set the tab order of the GUI components.
- 1.3 Fixed the CONNECT Universal Client GUI calendar controls by making the fonts consistent and removing the validation that prevents a user from leaving the calendar values empty.
- 1.4 Added the background gradient, CMMC logo, and NHIN logo to the CONNECT Universal Client GUI.
- 1.5 Moved the Social Security Administration OID from the gateway.properties file to the universalClient.properties file and modified Page2.java to use the universalClient.properties file for the SSA OID.
- 1.6 Modified the code that reads the local repository id's, so that it is "static" and only processed one time when documents are retrieved.
- 1.7 An error discovered during the September 15th Interoperability testing session was resolved by making certain the "repositoryld" value, contained within the Document Retrieve response, is properly populated.
- 1.8 The "resource-id" SAML attribute was added to all requests that are generated from the CONNECT Universal Client GUI. The addition of this attribute resolved display issues that were experienced when trying to view Interoperability Testing results via the ONC testing interface.
- 1.9 All items from the final Bill of Material submission have been identified and verified against the original purchase orders and invoices.
- 2.0 In order to facilitate information and code sharing across organizations, Allen Barger and Reed Haslam have been participating in weekly discussions with CMMC and TATRC.

- 2.1 On September 27, 2011, Allen Barger, Emily Reynolds and Reed Haslam attended a discussion at CMMC in which the integration of the CONNECT Universal Client GUI and Consumer Preferences Profile GUI with the Care Portal application was discussed. It was decided to first secure the stand alone GUI using Open SSO and Lightweight Directory Access Protocol (LDAP) technology.
- 2.2 Identified errors contained within the C32 using the NIST validation tool. Subsequently began significant effort to resolve 60-70 errors to be compliant with the HITSP and Continuity of Care Document specifications.

Please refer to Appendix E and F for C32 and C62 samples.

NwHIN Onboarding Review

In order to participate in the NwHIN, participants must complete various phases of the Onboarding process before exchanging data. Test data was entered by MIS staff on various patients, including demographics (Initiate MPI) and clinical documents (Allscripts). CMMC has made tremendous progress over the past year and has been conditionally accepted to participate in the "Exchange" (see Appendix D). Stages #1-3 have been completed, #4 is pending. John Hargreaves attends monthly NwHIN coordinating committee meetings.

Stages Stage 1: Qualification	Description
	 After self-qualification, organization submits completed application package including the signed Data Use and Reciprocal Support Agreement (DURSA) NwHIN Implementation Team reviews application package and works with the organization as needed to complete the package NwHIN Implementation Team reviews application package and coordinates an eligibility review with the NwHIN Coordinating Committee (NCC) NCC reviews application package to ensure organization meets all eligibility requirements
Stage 2: Validation	
	 NwHIN Implementation Team sends test certificate and validation framework information to organization Organization configures its test environment and executes conformance and interoperability

testing

- Organization submits evidence of successful tests to NwHIN Implementation Team
- NwHIN Implementation Team prepares validation package and submits to NCC

Stage 3: NCC Review

- NwHIN Implementation Team coordinates a review with NCC to evaluate the application and validation results
- NCC evaluates application and makes a decision on whether to conditionally approve the organization or disapprove the organization and request remediation (if applicable)
- NCC notifies the NwHIN Implementation Team and the organization of membership status

Stage 4: Activation

- NwHIN Implementation Team provides production certificate and requests production registry information from the organization
- Organization provides production registry information to NwHIN Implementation Team
- NwHIN Implementation Team configures NHIN registry with organization's information
- NCC executes the DURSA Joinder
- NCC notifies organization of NHIN membership
- Organization is now a NwHIN Participant and ready to exchange data over the NwHIN Exchange

The following technical issues were encountered during various testing sessions with ONC contractors and were subsequently fixed in order to continue and pass conformance/interoperability testing:

- 1. authorOrPerformer tag missing
- 2. Class code and class code scheme are not concatenated
- 3. Error codes missing for failed document retrieve responses
- 4. Assertion/@ID (invalid leading character)
- 5. Attribute/AttributeValue shall be a plain text description of the name of the user
- Attribute/@Name = urn:oasis:names:tc:xspa:1.0:subject:organization-id (Missing "urn:oid:" prefix)
- 7. Attribute/@Name = urn:nhin:names:saml:homeCommunityId (Missing "urn:oid:" prefix)
- 8. Multiple Classification entryUUID's (id attribute in XML) not in UUID format
- 9. Multiple ExternalIdentifier entryUUID's (id attribute in XML) not in UUID format
- 10. DocumentEntry(urn:uuid:2162a61c-dc42-47ad-b7b7-42cde022c1dd): availabilityStatus attribute (status attribute in XML) must be present

- 11. DocumentEntry(urn:uuid:2162a61c-dc42-47ad-b7b7-42cde022c1dd): lid attribute empty or missing
- 12. Slot creationTime: 20110607155024-0400 is not in HL7 V2 DateTime format
- 13. Slot repositoryUniqueld: 1 is not in OID format
- 14. DocumentEntry(urn:uuid:2162a61c-dc42-47ad-b7b7-42cde022c1dd): VersionInfo attribute missing
- 15. RegistryResponseValidator: status attribute must be [urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure]
- 16. empty <ns4:RegistryErrorList/> included in RDR 3.1
- 17. resource-id in the SAML header not present
- 18. coding scheme incorrect in doc query response
- 19. <ns7:RepositoryUniqueId> not populated in the doc retrieve response

Discussions with the Department of Veterans Affairs (VA)

Various discussions and email communications have occurred with the VA over the past year. During the HIMSS conference in February 2011, John Hargreaves performed a demo of the CMMC exchange for Tim Cromwell in the Interoperability Showcase area. In June 2011, Judith Hutman introduced Omar Bouhaddou (from the VA) to CMMC. These technical contacts have been very helpful answering questions about patient discovery and document query. Consequently, John Hargreaves participated in two Virtual Lifetime Electronic Record (VLER) workgroup discussions (led by Nona Hall – DoD) on July 1, 2011 and July 8, 2011.

More recently, CMMC had a display at the Laurel Highlands Veterans Information Program (VIP) Seminar on August 17, 2011 in Johnstown, PA. John Hargreaves had a discussion with Andrea Young, Public Affairs Officer, at the James E. Van Zandt VA Medical Center in Altoona, PA. CMMC again expressed an interest in a local NwHIN pilot.

Dr. Steffensen introduced Jamie Bennett (VLER Project Manager) to CMMC on August 26, 2011. John Hargreaves followed up the introduction with an overview of the project and status of NwHIN Onboarding. CMMC continued to provide milestone updates in September 2011 and Jamie Bennett stated she would be in contact in October 2011, as five new VA partners were going LIVE shortly. CMMC is looking forward to future engagements with VA stakeholders.

Immunizations Exchange

John Hargreaves/CMMC had a discussion with Frank Caniglia from the Pennsylvania Department of Health on June 1, 2011. Both parties reviewed the proposed exchange architecture using CONNECT and written process flow. CMMC is awaiting feedback to determine if the project will move forward.

Subtask 2.2 Provide technical and documentation assistance on DoD-managed Virtual Lifetime Electronic Record (VLER) efforts.

CMMC has not been asked by TATRC representatives to provide direct support for VLER initiatives to date.

Subtask 2.3 Investigate productizing a Patient Consent module using established standards, such as TP20/XACML.

Draft deliverable completed by Northrop Grumman. Document sent via email to TATRC for review and input on July 5, 2011.

Subtask 2.4 Assess and analyze NHIN-related activities, to include data center performance metrics, physician evaluation and usage of the NHIN Portal, and resulting benefits of HIE with federal participants.

Research protocol development is pending until federal partners have been solidified for health information exchange via NwHIN. It would be premature to identify specific research hypotheses and objectives at this time.

Conclusion

Challenges with Onboarding to the Nationwide Health Information Network have been met with commitment and ultimate success. Various technical issues have been overcome in adhering to NwHIN/IHE/HITSP/HL7 specifications using the open source CONNECT 3.1 framework and three backend system adapters (Initiate/Allscripts/McKesson). CMMC has expressed an interest in a local NwHIN pilot with the Department of Veterans Affairs to improve medical care to veterans in our service area.

Key Research Accomplishments

- Pharmacy automation fully deployed at CMMC and MYMC
- Three BCMA pilot units live at CMMC
- Baseline data collection (research) 95% complete
- CMMC conditionally accepted to participate in NwHIN "Exchange"
- Numerous discussions with VA about pilot project
- Code sharing to TATRC subversion and Alembic Foundation

Reportable Outcomes

Presentations

- CMMC Research Poster Symposium
- TATRC Site Visit
- Laurel Highlands Veterans Information Program (VIP) Seminar

<u>Licenses</u>

• Open source license completed for CMMC code donations

Conclusion

Conemaugh Memorial Medical Center has made significant progress on both arms of the project throughout the past year. The Statement of Work (SOW) tasks are being executed as stated. Technical implementations and research activities are progressing on schedule with no deviations. We hope other organizations find our lessons learned useful.

Appendix A - Pictures of CMMC Pharmacy Robotics Implementation





Appendix B – Nursing Quick Reference Guide (Admin-Rx)

Nursing Quick Reference Guide Admin-Rx



MMC Help Desk x9195

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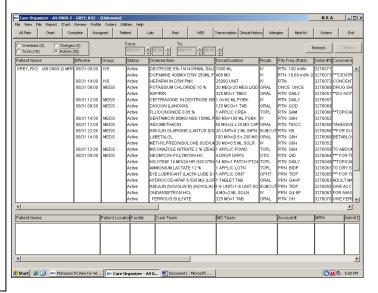
Care Organizer - Select patient name vs. scanning the wristband

- * If the patient's wristband is unavailable from the Admissions Dept, this function may be used ~ if the patient's wristband is simply missing, it <u>must</u> be replaced <u>immediately</u>
- 1. Click the "Patient" button
 - √ Your department census will be the default
- 2. Click on & highlight the patient's name
 - √ You may need to complete an active search if the patient has not been added to the census by the Admissions Dept
- 3. Click "OK"

Care Organizer – "Active" Radio Button

- The "Active" radio button will display all of the active medications ordered for that patient
- The patient's name is in the 1st column
- "Effective" (2^{nd}) column lists the date & time that the med was ordered
- They are organized by groups (3rd column):
 - IVs
 - Meds
 - Meds-RT (Respiratory meds)
- The other columns list med name, dose, route, frequency & any pertinent comments





Care Organizer - "To Do" Radio Button

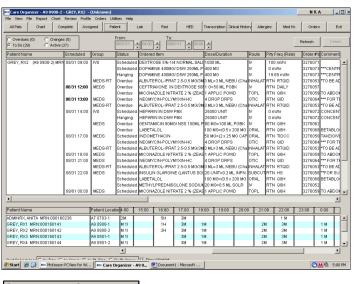
- The "To Do" radio button will display all of the active medications to be administered during the set timeframe
- The set timeframe is 24 hours ~ 12 hours before log-in and 12 hours after log-in time
- Meds are listed chronologically, in order of administration times, in the "Scheduled" column
- The bottom of the screen will provide a timed work-list of when meds are due. Abbreviations include:

M = med I = IV med H = hanging IVF

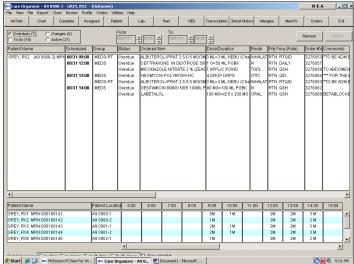
- By clicking on these abbreviations, Care Organizer will show you only those meds to be administered for that hour

- The "Overdue" radio button will display any medications that are overdue and require administration
- If you want to hold these medications until the next scheduled dose, they must be documented as being "held" in HED (refer to page 18)
- If you want to administer these meds at a later time, before the next scheduled dose, they may be administered late in HED (refer to page 19)



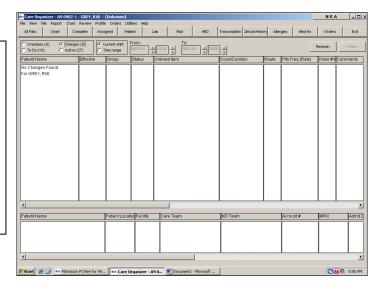






Care Organizer - "Changes" Radio Button

- The "Changes" radio button will display any medication orders that have been changed
- Changed medication orders will need to be confirmed (refer to page 10)
- This screen will display changed med orders exclusively ~ the "Active" and "To Do" screens will also show these changed orders, as well as any other active med orders



Care Organizer - Single Medication Confirmation

- * All medication orders needing confirmed will be highlighted in yellow
- * Med orders needing confirmation include new med orders, changed or discontinued med orders
- 1. Double-click on the highlighted medication
- 2. Review med order detail screen
- 3. Select "Confirm"
- 4. Click "OK"

<u>Care Organizer – Multiple Medication Confirmation</u> 1. Click on the "View" drop-down menu

- 2. Select "Confirm Unconfirmed"
- 3. Review med order detail screen
- 4. Select "Confirm"
- 5. Click "OK"
- 6. The next med detail screen will appear and the confirmation process will continue until all meds needing confirmation are completed
 - ✓ If you need to stop the multiple confirmation process at any time, click the "Stop Confirming" button at the bottom of the screen

Scheduled Med Administration with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
 - ✓ Scheduled meds due in the 1 hour administration timeframe, from login, will be listed
- 6. Scan the medication(s) barcodes
 - ✓ As you scan, ensure the med name, dose & route correctly populate in the highlighted row
 - ✓ If you've scanned a med by accident & wish to remove it from the highlighted med list, click the button
- 7. Scan the patient's wristband again to enter confirmation screen
- 8. Review list of meds for that charting session & annotate any information as needed
- 9. Administer the medication(s) to the patient
- 10. Click "Confirm"



Scheduled Med Administration without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
- 6. Click the underlined med name/link
- 7. Review the med order details to verify it matches the med that you are administering
- 9. Ensure the med name, dose & route correctly populate in the highlighted row
- 10. Scan the patient's wristband again to enter confirmation screen
- 11. Review list of meds for that charting session & annotate any information as needed
- 12. Administer the medication(s) to the patient
- 13. Click "Confirm"



PRN Med Administration with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Scan the PRN medication barcode
 - ✓ You may review the PRN meds available in either Care Organizer or by selecting "Review Med Order" in the "ALL MEDS" class bar in HED
- 6. Ensure the med name, dose & route correctly populate in the highlighted row
- 7. Scan the patient's wristband again to enter confirmation screen
- 8. Review meds for charting session & annotate any information as needed
- 9. Administer the medication(s) to the patient
- 10. Click "Confirm"



PRN Med Administration without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
- 6. Click "Med Orders" on the "ALL MEDS" class bar
- 7. Select "Active PRN" on the left-hand column
- 8. Click on the PRN med name that you are going to administer
- 9. Click Madmin Med button on the bottom right-hand corner
- 10. Ensure the med name, dose & route correctly populate in the highlighted row
- 11. Scan the patient's wristband again to enter confirmation screen
- 12. Review list of meds for charting session & annotate any information as needed
- 13. Administer the medication(s) to the patient
- 14. Click "Confirm"



Add a Medication (Stat, Verbal Order, etc) with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
- 6. Scan the medication barcode
- 7. Review scanned med name, dose & route and modify any information as needed
- 8. Scan the patient's wristband again to enter confirmation screen
- 9. Provide override reason from the drop-down menu
 - ✓ Override type will be "No Med Order Found"
- 10. Click "Override"
- 11. Review list of meds for charting session & annotate any information as needed
- 12. Administer the medication(s) to the patient
- 13. Click "Confirm"



Add a Medication (Stat, Verbal Order, etc) without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
- 6. Click "Add" on the "ALL MEDS" class bar to access MMC Formulary
 - √ MMC Formulary is searchable by generic/primary name ~ the brand/secondary name is
 populated into the 2nd column
- 7. Type in the generic med name
- 8. Scroll down to find the appropriate dose & route
 - ✓ There may be multiple listings of the same dosage & route ~ that's due to meds being obtained from multiple drug companies. Simply choose one of the meds with the correct dosage & route.
- 9. Select the appropriate medication

continued \rightarrow

- 10. Click "✓Add" on the bottom right-hand corner
- 11. Ensure the med name, dose & route correctly populate in the highlighted row
- 12. Scan the patient's wristband again to enter confirmation screen
- 13. Provide override reason from the drop-down menu
 - ✓ Override type will be "No Med Order Found"
- 14. Click "Override"
- 15. Review list of meds for charting session & annotate any information as needed
- 16. Administer the medication(s) to the patient
- 17. Click "Confirm"



Hold a Scheduled Med

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click Admin on the "ALL MEDS" class bar
- 6. Click the underlined med name/link
- 7. Click Admin Med button on the bottom right-hand corner
- 8. Using the drop-down box farthest right in the highlighted row, select a reason for not administering the med
 - ✓ You may annotate a more specific reason by clicking ☐ the icon, just as you would for your usual HED charting
- 9. Click "Save"
- 10. Review med information & annotate as needed
- 11. Click "Confirm"



Administer a Med Early or Late

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
 - √ If there are overdue meds, the "ALL MEDS" class bar will be RED
- 5. Scan the medication barcode
- 6. Ensure the med name, dose & route correctly populate in the highlighted row
- 7. Scan the patient's wristband again to enter confirmation screen
- 8. Provide override reason from the drop-down menu
 - ✓ Override type will be "Admin Too Early" or "Admin Too Late"
- 9. Click "Override"
- 10. Review med information & annotate as needed
- 11. Click "Confirm"



Modify a Medication Administration

* Remember, you can only modify your own charting



- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click on the med administration that you need to modify
- 6. Click on the field that you want to modify
- 7. Chart the correct information in the charting field
- 8. Under "Admin Note," type "mistaken entry"
- 9. Click "Save"

Add Viaflex Stop Time

Add viaflex stop time for med hung by you/current shift

- 1. Login to Care Organizer
- 2. Scan the patient's wristband (if at the bedside) or manually select (if at the nursing station)
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click on the med administration that you need to modify
- 6. Under "Admin Note," type "STOP TIME (insert time here)"
- 7. Click "Save"

Add viaflex stop time for med hung by another nurse/prior shift

- 1. Login to Care Organizer
- 2. Scan the patient's wristband (if at the bedside) or manually select (if at the nursing station)
- 3. Click "HED" button
- 4. Click "Meds" tab
- 5. Click on the med administration that you need to modify
- 6. Click on the "Click to Cosign" field
 - √ The time that you cosign is now the viaflex stop time
- 7. Click "Save"



Hang Scheduled 24-hr Infusion with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Scan the IVF barcode
- 6. Review the infusion rate and modify if necessary
- 7. Select IV site from "Site" drop-down menu
- 8. Click "Save"
- 9. Click "Exit"



Hang Scheduled 24-hr Infusion without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Click "New IV..." button on top left of screen
- 6. Select the appropriate IVF, as listed under "Available Ordered Bottles"
- 7. Click "**OK**"
- 8. Review infusion rate & modify if necessary
- 9. Select IV site from "Site" drop-down menu
- 10. Click "Save"
- 11. Click "Exit"



Add 24-hr Infusion (Stat, Verbal Order, etc) with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Scan the IVF barcode
- 6. Type in the infusion rate
- 7. Select IV site from "Site" drop-down menu
- 8. Click "Save"
- 9. Click "Exit"



Add 24-hr Infusion (Stat, Verbal Order, etc) without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Click "New IV..." button on top left of screen
- 6. Click "OK" in the warning box
- 7. Scroll down and select the appropriate IV med listed under "Stock Bottles"
- 8. Click "OK"
- 9. Type in the infusion rate
- 10. Select IV site from "Site" drop-down menu
- 11. Click "Save"
- 12. Click "Exit"



Hang Scheduled 24-hr Weight-Based Infusion with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Scan the IV med barcode

6. Review the patient's weight and add if missing

- ✓ The patient's weight will populate from the weight documented in the Care Manager flowsheet
- 7. Verify default dose units are correct (mcg/kg/min, etc)
- 8. Type in the dose
 - ✓ The infusion rate will automatically calculate when the dose rate is entered or vice versa
- 9. Select IV site from "Site" drop-down menu
- 10. Click "Save"
- 11. Click "Exit"



Hang Scheduled 24-hr Weight-Based Infusion without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Click "New IV..." button on top left of screen
- 6. Select the appropriate IV med, as listed under "Available Ordered Bottles"
- 7. Click "**OK**"
- 8. Review the patient's weight and type in if missing
 - ✓ The patient's weight will populate from the weight documented in the Care Manager flowsheet
- 9. Verify default dose units are correct (mcg/kg/min, etc)



continued \rightarrow

10. Type in the dose

- \checkmark The infusion rate will automatically calculate when the dose rate is entered or vice versa
- 11. Select IV site from "Site" drop-down menu
- 12. Click "Save"
- 13. Click "Exit"



Add 24-hr Weight-Based Infusion (Stat, Verbal Order, etc) with a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Scan the IV med barcode
- 6. Review the patient's weight and add if missing
 - \checkmark The patient's weight will populate from the weight documented in the Care Manager flowsheet
- 7. Verify default dose units are correct (mcg/kg/min, etc)
- 8. Type in the dose
 - ✓ The infusion rate will automatically calculate when the dose rate is entered or vice versa
- 9. Select IV site from "Site" drop-down menu
- 10. Click "Save"
- 11. Click "Exit"



Add 24-hr Weight-Based Infusion (Stat, Verbal Order, etc) without a Barcode

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Click "New IV..." button on top left of screen
- 6. Click "OK" in the warning box
- 7. Scroll down and select the appropriate IV med listed under "Stock Bottles"
- 8. Click "OK"
- 9. Review the patient's weight and add if missing
 - \checkmark The patient's weight will populate from the weight documented in the Care Manager flowsheet
- 10. Verify default dose units are correct (mcg/kg/min, etc)



continued \rightarrow

- 11. Type in the dose
 - \checkmark The infusion rate will automatically calculate when the dose rate is entered or vice versa
- 12. Select IV site from "Site" drop-down menu
- 13. Click "Save"
- 14. Click "Exit"



End Infusion Bag & Hang New Infusion Bag (Stop Time)

- 1. Login to Care Organizer
- 2. Scan the patient's wristband
- 3. Click "HED" button
- 4. Click "IV Admin" tab
- 5. Click on & select the IVF that is currently hanging
- 6. Click the "End b" checkbox
 - √ This assigns a stop time to the current bag
- 7. Click "Save" in the right upper corner
- 8. Scan the new IVF bag
- 9. Review infusion rate and modify if necessary
- 10. Select IV site from "Site" drop-down menu
- 11. Click "Save" in the right upper corner
- 12. Click "Exit"



Directions to Print MAR

- * MAR will be printed prior to surgery/procedure & transfer to different unit or facility
- 1. Login to Care Organizer
- 2. Select patient by clicking "Patient" button
- 3. Click on "Report" drop-down menu
- 4. Scroll to and highlight "Admin Rx Report"
- 5. Select "Medication Administration Report"
- 6. Click on "Send"
- 7. Press "Enter" key
 - √ You do not save this as a permanent chart document

Directions to Print IV MAR

- * MAR will be printed prior to surgery/procedure & transfer to different unit or facility
- 1. Login to Care Organizer
- 2. Select patient by clicking "Patient" button
- 3. Click on "Report" drop-down menu
- 4. Scroll to and highlight "Admin Rx Report"
- 5. Select "IV Administration Report"
- 6. Click on "Send"
- 7. Press "Enter" key
 - √ You do not save this as a permanent chart document

Appendix 1 – IV Site Abbreviations

R1 - right hand	L FT – left foot
L1 - left hand	R LL – right lower leg
R2 – right wrist/forearm	L LL – left lower leg
L2 – left wrist/forearm	RANK – right ankle
R3 - right antecubital	LANK – left ankle
L3 – left antecubital	SCLP – scalp
R4 – right upper arm	1 RH – right hand (RICN)
L4 – left upper arm	1 LH – left hand (RICN)
REJ – right external jugular	2 RW – right wrist (RICN)
LEJ – left external jugular	2 LW – left wrist (RICN)
RCVC - right central venous catheter	RAF – right antecubital fossa (RICN)
LCVC - left central venous catheter	LAF – left antecubital fossa (RICN)
R FT – right foot	RIUF – right inner upper forearm (RICN)

Appendix 1 – IV Site Abbreviations (continued)

ROAF – right outer aspect forearm (RICN)	LIUF – left inner upper forearm (RICN)
LOAF – left outer aspect forearm (RICN)	R TH – right thigh (RICN)
RIAF – right inner aspect forearm (RICN)	L TH – left thigh (RICN)
LIAF – left inner aspect forearm (RICN)	

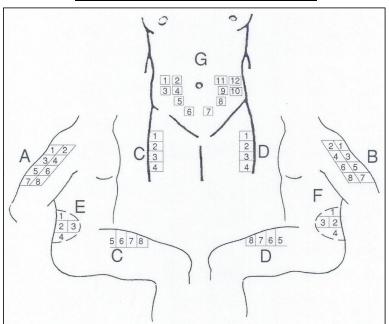
Appendix 2 – Injection Site Abbreviations

RD – right deltoid (IM)	SQLA – left arm (SQ)	SQA7 – A7 (SQ insulin)
LD – left deltoid (IM)	SRUQ – RUQ (SQ)	SQA8 – A8 (SQ insulin)
RLT – right lateral thigh (IM)	SRLQ – RLQ (SQ)	SQB1 – B1 (SQ insulin)
LLT – left lateral thigh (IM)	SLUQ – LUQ (SQ)	SQB2 – B2 (SQ insulin)
RDG – right dorsogluteal (IM)	SLLQ – LLQ (SQ)	SQB3 – B3 (SQ insulin)
LDG – left dorsogluteal (IM)	SRIC – right iliac crest (SQ)	SQB4 – B4 (SQ insulin)
RVG – right ventrogluteal (IM)	SLIC – left iliac crest (SQ)	SQB5 – B5 (SQ insulin)
LVG – left ventrogluteal (IM)	SQA1 – A1 (SQ insulin)	SQB6 – B6 (SQ insulin)
RAT – right anterior thigh (IM)	SQA2 – A2 (SQ insulin)	SQB7 – B7 (SQ insulin)
LAT – left anterior thigh (IM)	SQA3 – A3 (SQ insulin)	SQB8 – B8 (SQ insulin)
SQRL - right leg (SQ)	SQA4 – A4 (SQ insulin)	SQC1 – C1 (SQ insulin)
SQLL – left leg (SQ)	SQA5 – A5 (SQ insulin)	SQC2 – C2 (SQ insulin)
SQRA – right arm (SQ)	SQA6 – A6 (SQ insulin)	SQC3 – C3 (SQ insulin)

Appendix 2 – Injection Site Abbreviations (continued)

SQC4 - C4 (SQ insulin)	SQD7 – D7 (SQ insulin)	SQG2 – G2 (SQ insulin)
SQC5 – C5 (SQ insulin)	SQD8 – D8 (SQ insulin)	SQG3 – G3 (SQ insulin)
SQC6 – C6 (SQ insulin)	SQE1 – E1 (SQ insulin)	SQG4 – G4 (SQ insulin)
SQC7 – C7 (SQ insulin)	SQE2 – E2 (SQ insulin)	SQG5 – G5 (SQ insulin)
SQC8 – C8 (SQ insulin)	SQE3 – E3 (SQ insulin)	SQG6 – G6 (SQ insulin)
SQD1 – D1 (SQ insulin)	SQE4 – E4 (SQ insulin)	SQG7 – G7 (SQ insulin)
SQD2 – D2 (SQ insulin)	SQF1 – F1 (SQ insulin)	SQG8 – G8 (SQ insulin)
SQD3 – D3 (SQ insulin)	SQF2 – F2 (SQ insulin)	SQG9 – G9 (SQ insulin)
SQD4 – D4 (SQ insulin)	SQF3 – F3 (SQ insulin)	SQG10 – G10 (SQ insulin)
SQD5 – D5 (SQ insulin)	SQF4 – F4 (SQ insulin)	SQG11 – G11 (SQ insulin)
SQD6 – D6 (SQ insulin)	SQG1 – G1 (SQ insulin)	SQG12 – G12 (SQ insulin)

Appendix 3 – SQ Insulin Injection Map



Appendix C – Care Organizer Training Manual for Admin-Rx

Care Organizer

Training Manual

For

Documentation Admin Rx

OBJECTIVES:

- To have a basic understanding of the Care Organizer functionality
- To initiate thinking of how Care Organizer can assist you with your daily workload
- To have a basic understanding of the Medication Administration screen.
- To have a basic understanding of the IV administration screen
- To be able to manually print the medication administration report and IV administration report.

Care organizer is a tool to help clinicians to organize and plan their work day. It provides a central location where tasks and to do items can be viewed. Care Organizer will be the default screen for nursing staff. Care Organizer will be utilized to:

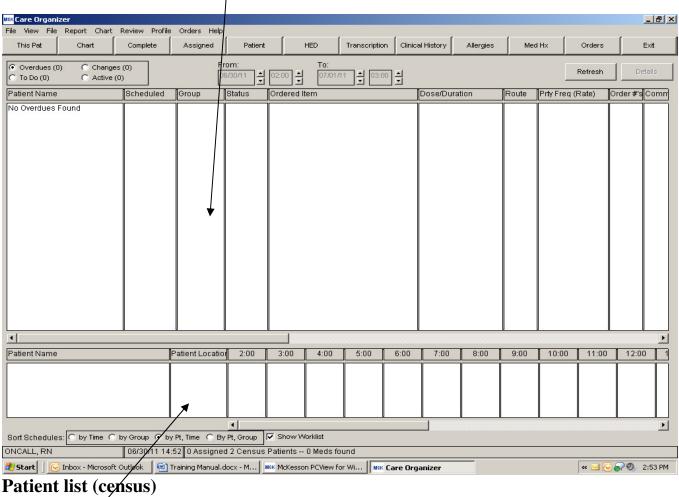
- Confirm orders all unverified orders remain bold and highlighted in yellow until they are confirmed. Stat orders appear bold and in red
- Perform 24 hour chart checks, comparing the electronic worklist to the actual written order.
- Clinical documentation
- Review, document, confirm and complete medications, IV's and orders.

Care Organizer:

If you are a current user of Care Manager, you will sign on to Care Organizer using the same login and password. Care Organizer will automatically open when the user logs on to PC view.

The Care Organizer screen looks different but allows you to continue to utilize the system with some new functionality.

Patient information window, (worklist)



Menu Bar: Functions you will use under the choices in the menu bar FILE: You are able to set documentation time, drop you into patient select, look for encounter and to sign off PCM and exit.

VIEW - You are able to refresh the screen, view the detail of a selected order, complete (for some departments), confirm/unconfirm will proceed you through all of the unconfirmed orders, this patient will toggle you from this patient to all patients, and the last 3, Medication, IV's and Orders are to be checked to view them on the Patient information window.

FILE - to select past encounters.

Report - Used to select reports to print, like we are currently printing. Two new reports have been added under Admin RX.

Chart, Review, Profile, Orders, Utilities, and Help functionality remain the same.

Buttons you will use in Care organizer:

'This patient' – toggles to 'all patients' to view in the Patient information window.

Complete – used to complete orders

Patient – will put you into the patient select screen.

Lab, Rad, Transcription, Clinical History, Allergies, Med Hx, and Orders have no change in functionality.

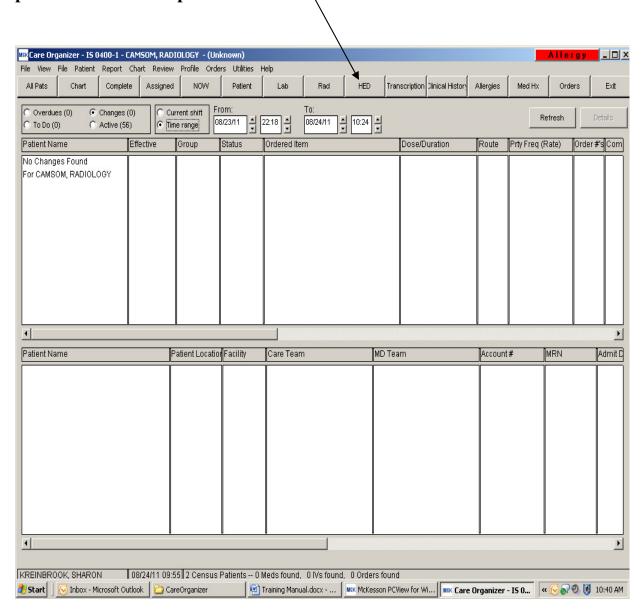
HED button will take you to the HED documentation screen.

The next block of radio buttons will give you options to view overdue, and to do items with (0) showing the number of items in the patient information window for all patients or this patient.

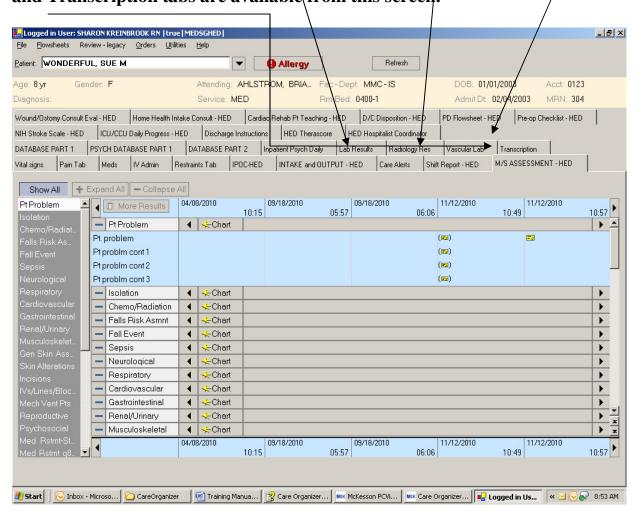
The next 2 radio buttons, Changes and Active with (0) showing the number will let you choose the next radio buttons for 'this shift' or 'time range'. When time range is selected the from/to blocks will be available for dates and times. This function will give you the flexibility to look at changes and active items for different ranges of time.

The last 2 buttons: Refresh, will refresh your screen with any updates that have occurred. Detail/Confirm, the button will be confirm if there are orders that need confirmed, or Detail to let you view the detail of previously confirmed orders.

After you have selected the patient that you want to document on by highlighting, then click on the HED button, or click HED and select the patient from the dropdown.

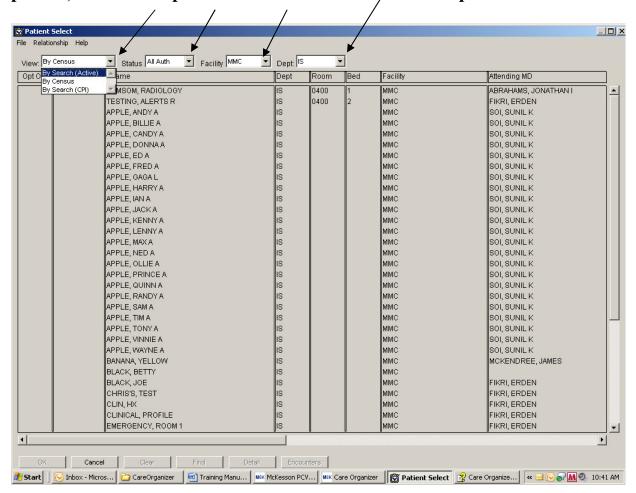


You will then be in the HED documentation screen. Document on your patient as usual. Remember that Lab results, Radiology results, Vascular lab and Transcription tabs are available from this screen.



Complete all documentation using the appropriate tabs. Modify and inactivate as needed following current policy. There are no changes to the documentation process after accessing the HED screen.

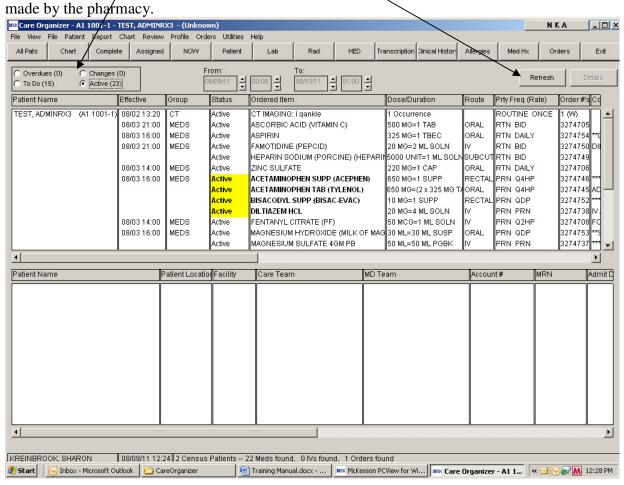
You are able to search for a patient as always in care manager under the patient button, by view, patient status, facility or department. To select a patient, click on the patient then OK or double click the patient.



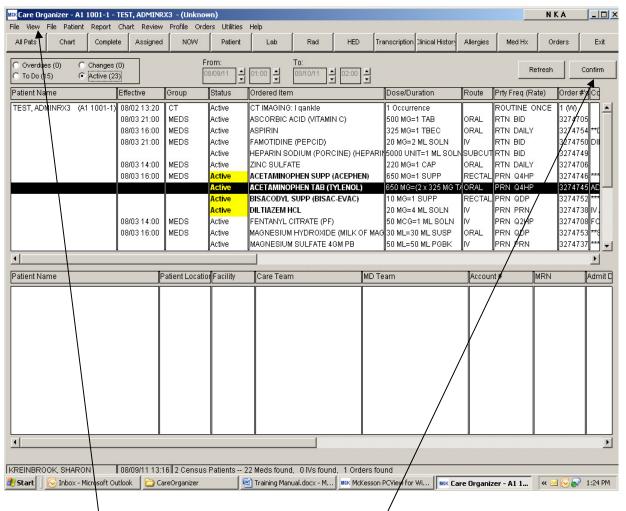
ADMINISTER MEDICATION UTILIZING CARE ORGANIZER:

The preferred method of patient selection for medication administration is to scan the patient's bar coded wristband. However you may still manually select the patient if needed. The selected or scanned patient will appear in the patient information window.

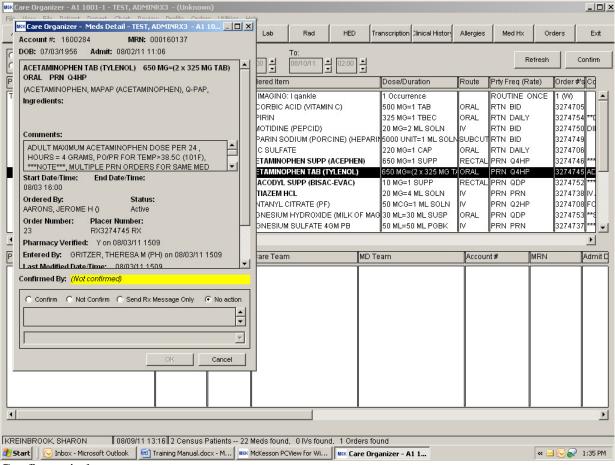
The user may choose available information from the display options. Choices are overdue, to do, changes and active. Click the refresh button to check for medication additions that have been



Physician orders are sent to the pharmacy and the pharmacy enters them into HMM to show in care organizer. Orders that are bolded and yellow must be confirmed. All medication orders must be confirmed against the written order.



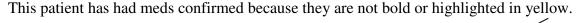
To confirm an order, highlight the med and click on the confirm button. Or to confirm more than one click on view, then confirm/unconfirm. Then you will be directed to confirm all unconfirmed orders one at a time. All meds should be confirmed prior to administration. You may need to give a medication that has not been entered by the pharmacy as in stat or extra dose med, however you must enter an override reason when warned that there is no order for the med.

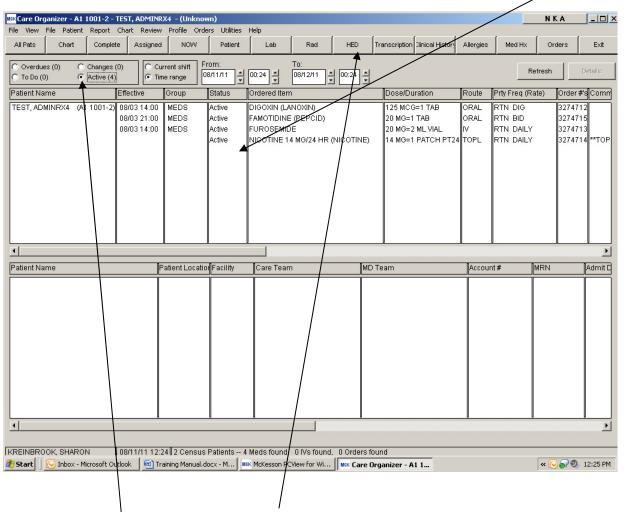


Confirm window.

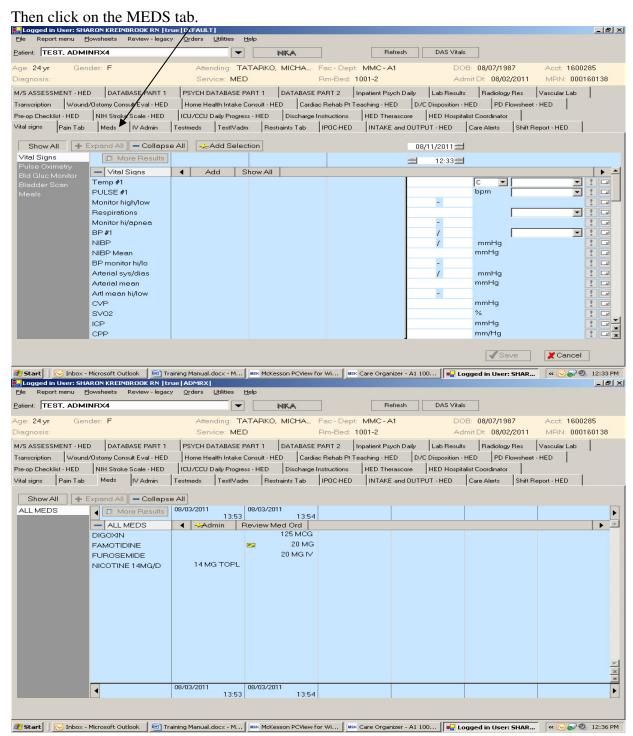
The confirm window will show you the detail of the medication order including start / stop times ordered by, order number, who in the pharmacy verified the order, entered by and last modified by. Your choices are: confirm, not confirm, send RX message only, and no action. Choose the appropriate action.

DO NOT use the send RX message function. The message will be attached to the patient only and not be printed or seen in the pharmacy unless that patient is accessed by the pharmacy. If you need to contact the pharmacy regarding a medication, do so using the current practice.





To administer medication, click on the HED tab, then scan the patient's arm band, Remember, when utilizing the active radio button in the display options of Care organizer, the shift parameters become available for use to define the view for medications and IV solutions. All bright yellow areas in Care Organizer in the HED screens signify that an action needs to be performed. All yellowed areas must be resolved for safe medication administration.



The meds tab will allow you review all the medication that has been given to the patient. Medication is viewed in columns by date and time.

Click on the Review Med Ord button (or Review med ord)

Review med order will open a box showing all meds ordered for the patient, entered by the pharmacy grouped by Active routine, Active PRN, D/C Routine, and D/C PRN followed by the



Some medications listed will be bracketed. Bracketed medications are:

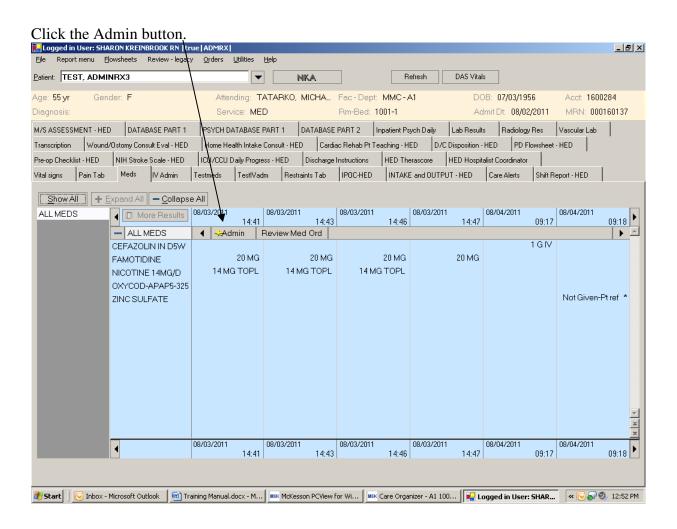
Joined orders – 2 drugs to equal 1 therapy

Simultaneous – 2 drug therapies given together

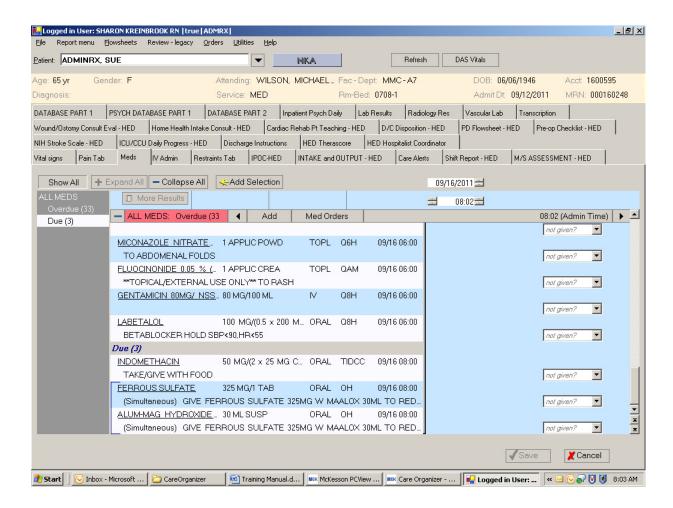
Chained – gradual increase or decrease in medication, using the word 'linked' as well.

Exclusive – two or more therapies where only can be given at indicated admission time. IM, PO, PR will be indicated with the use of 'or' in the list.

When finished checking meds, click ok. You will be back at the HED screen.

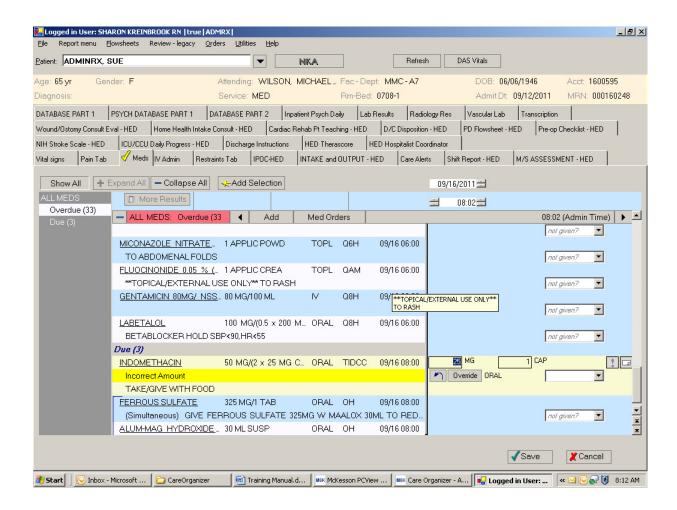


The medication administration screen will open. The drug and directions will list. Overdue medications will be in red on the top of the screen followed by the due meds

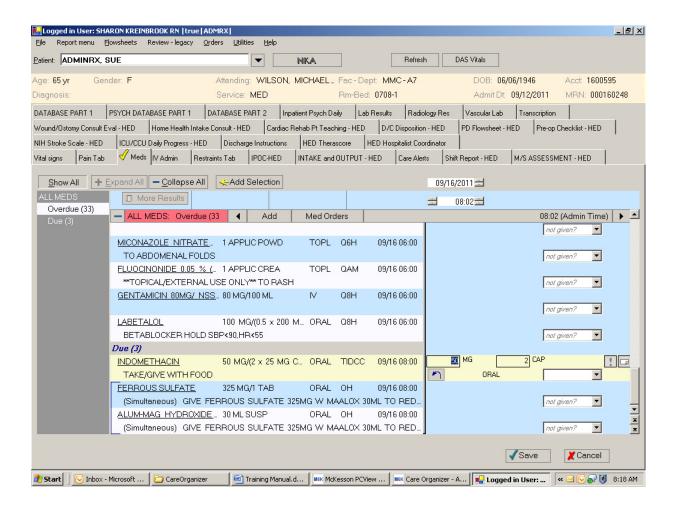


Scan the medication you want to administer.

The yellow visual cue must be resolved to safely administer the medication. The below med is the incorrect amount, you need to administer 2 capsules. Scan the second capsule.

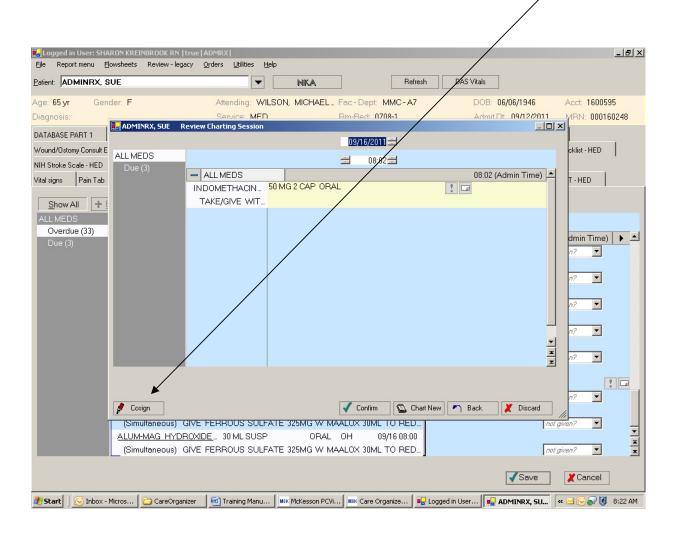


The bright yellow cue is resolved. Scan the patients wrist band.

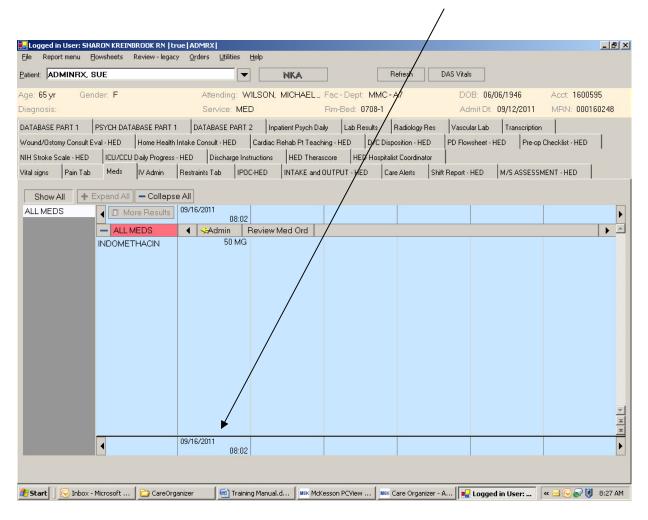


It will then bring up a confirm screen (just like in HED charting) with the same choices. Click confirm only after you have watched the patient take the medication.

Be sure to check all the parameters. Note the location of the cosign button. The co sign button is available when needed.

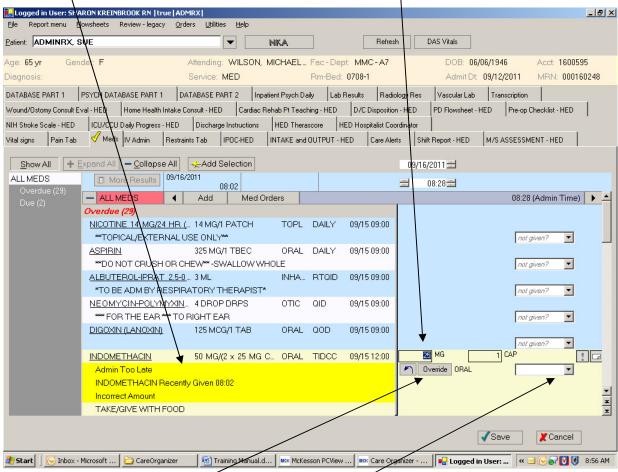


The medication will then be documented in the date and time column.



When you scan a med that was recently given, a warning message appears in yellow that states recently given. For this medication it is also the incorrect dosage.

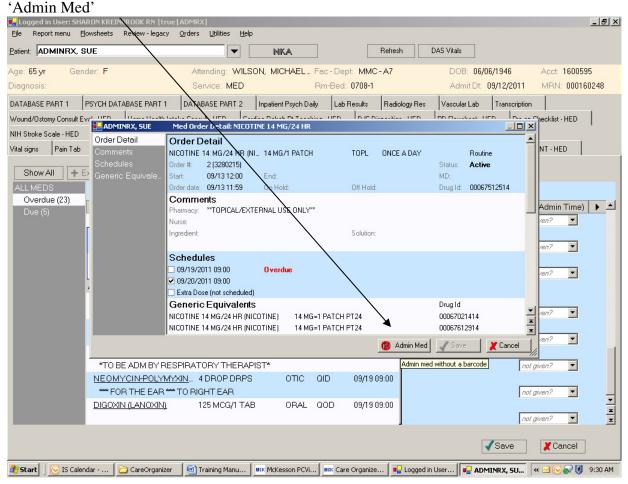
To remove the medication scanned in error, click the undo button.



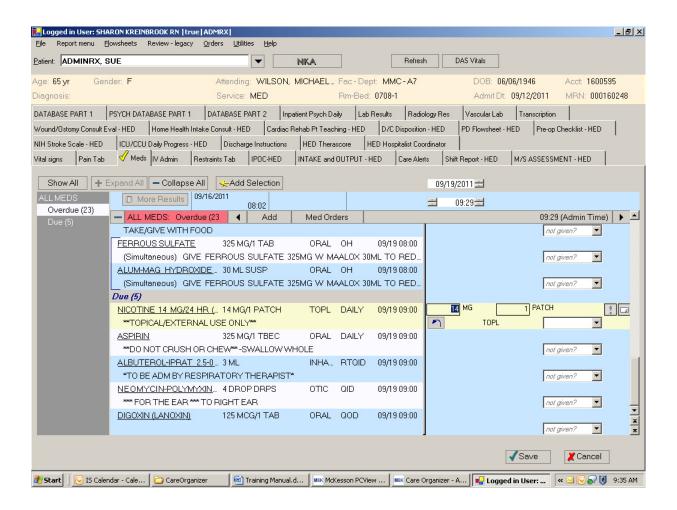
This is for the override reason.

This will chart the medication as NOT GIVEN.

Under the meds tab, click on the medication to see the schedule of the medication. If the bar code would not scan you can select the date and time of the scheduled med, then click

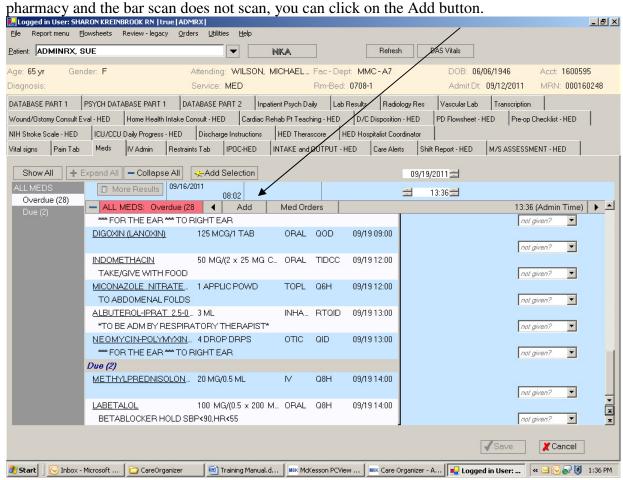


The medication admin panel will contain the med and you may proceed to scan the patients wristband, apply the medication and confirm.

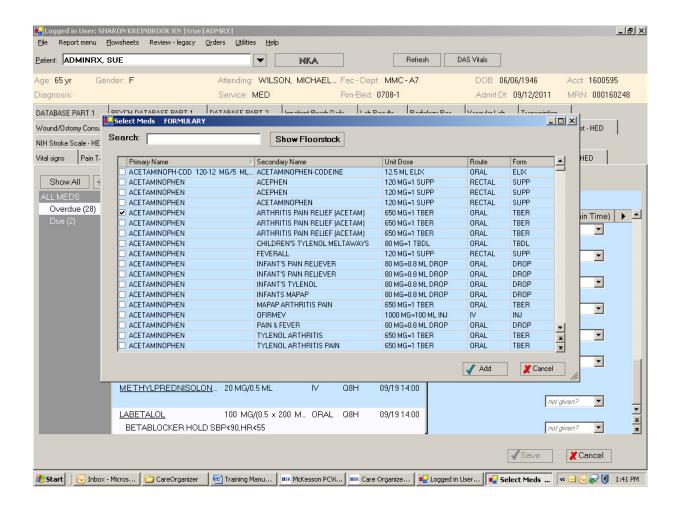


If you select a med 'not given' reason, the medication will be removed from the remaining schedules for that day.

When you are in HED and click on the admin button and the medication is not yet entered by the

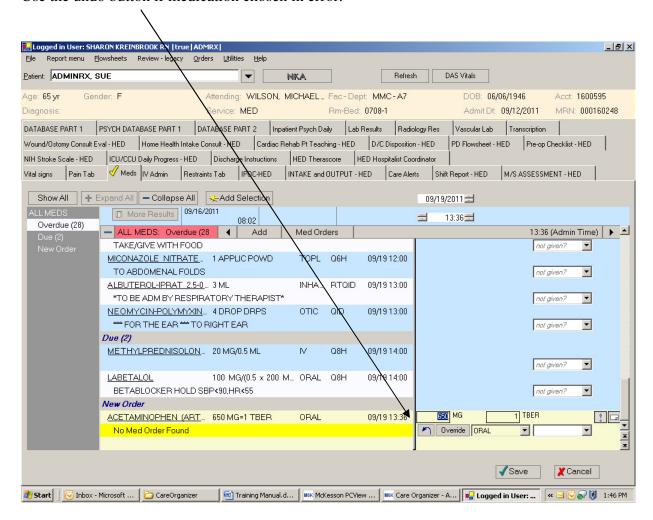


The Add button will put you into the pharmacy formulary where you can search for the med. Enter the generic name and click show floorstock then click on the item, then Add. (There are multiple selections of the same drug because the different drug companies have different barcodes).



It will look like you scanned the med. Resolve all yellow cues. Scan the patient, watch the patient take the med then click confirm.

Use the undo button if medication chosen in error.



To change the time a medication was administered: After the medication is given, click on the medication (as in Modify) click on the dark blue area, change the time in the 'clock' field and save. The medication will be moved to the appropriate time.

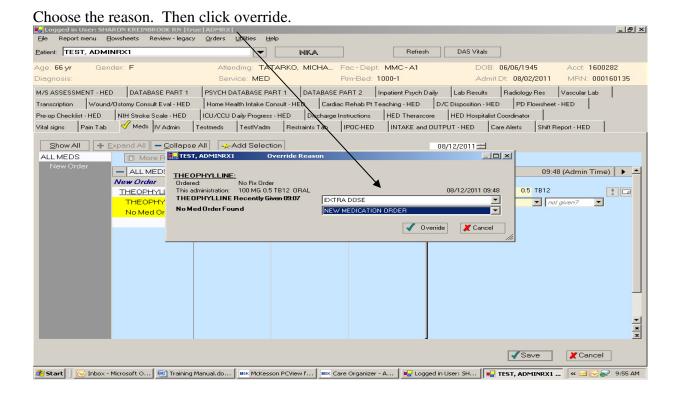
You must resolve the yellow visual cues to safely administer medication. Yellow cues will appear for:

- Administered too early
- Administered too late
- Incorrect amount
- No schedule found

- Recently given
- No med order found

A no schedule found order is considered a 0 order. The medication has not yet been entered by the pharmacy. The end user is still able to administer the medication by either scanning the medication or selecting it from a list of formulary medications. (Use the ADD button to see the formulary, as above). Important to note even though this action is allowed in the system it should be kept to a minimum because it bypasses the electronic safety of medication administration.

If you click save without resolving the yellow visual cue, the system will force you to answer the override questions for the warnings. (see below)



Remember, there is a cosign button if needed. Then confirm. EL Logged in User: SHARON KREINBROOK RN | true | ADMRX |
Elle Report menu Flowsheets Review - legacy Orders Utilities Help _ 8 × Patient: TEST, ADMINRX1 efresh DAS Vitals Age: 66 yr Attending: TATARKO, MICHA... Fac-Dept. MMC DOB: 06/06/1945 Acct: 1600282 MED Bm-Bed: 1000-1 Admit Dt 08/02/2011 MRN: 000160135 Service: MFI

M/S ASSESSMENT - HEI

Service: MFI

Review Charting Session

Review Charting Session cular Lab Transcription Wound ALL MEDS 10:14 Pre-op Checklist - HED - ALL MEDS 10:14 (Admin Time) Vital signs Pain Tab - HED 200 MG 1 TB12 ORAL ! 🗔 THEOPHYLLING Show All + E ALL MEDS dmin Time) 🕨 📤 🤌 Cosign Confirm Chart New A Back 3 Start Cinbox - Microsoft O... Training Manual.do... Will Training Manual.do... Will McKesson PCView F... Will Care Organizer - A... 🖳 Organizer - A... 🖳 Training Manual.do... Will Training Manual.do... Will Training Manual.do...

The medication will be charted for the date and time given.

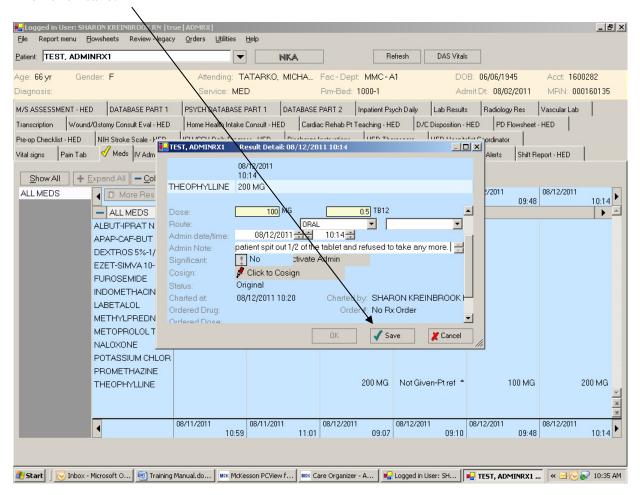
Logged in User: SHARON KREINBROOK RN [true | ADMRX] <u>Fi</u>le Report menu <u>Fl</u>owsheets Review - legacy <u>O</u>rders <u>U</u>tilities Patient: TEST, ADMINRX1 DAS Vitals NKA Age: 66 yr Gender: F Attending: TATARKO, MICHA... Fac-Dept: MMC DOB: 06/06/1945 Acct: 1600282 Diagnosis Service: MED Rm-Bed: 1000-1 Admit Dt: 08/02/2011 MRN: 000160135 M/S ASSESSMENT - HED DATABASE PART 1 PSYCH DATABASE PART 1 DATABASE PART 2 Inpatient Psych Daily Lab Results Radiology Res Vascular Lab Transcription Wound/Ostomy Consult Eval - HED Pre-op Checklist - HED NIH Stroke Scale - HED | ICU/CCU Daily Progress - HED | Discharge Instructions | HED Therascon HED Hospitalist Coordinator Vital signs Pain Tab Meds IV Admin Testmeds Test/Vadm Restraints Tab IPOC-HED INTAKE and OUTPUT - HED | Care Alerts | Shift Report - HED | Show All + Expand All - Collapse All ALL MEDS ■ More Results | 08/11/2011 08/11/2011 08/12/2011 08/12/2011 08/12/2011 08/12/2011 10:14 10:59 11:01 09:07 9:10 09:48 **)** A - ALL MEDS ◀ ¾Admin Review Med Ord ALBUT-IPRAT NEB 3 ML INHALATI APAP-CAF-BUT 325 DEXTROS 5%-1/2NS EZET-SIMVA 10-10 FUROSEMIDE Not Given-Ptiref * INDOMETHACIN 100 MG LABETALOL METHYLPREDNISOL METOPROLOL TART NALOXONE POTASSIUM CHLOR PROMETHAZINE THEOPHYLLINE 200 MG Not Given-Pt ref * 100 N 200 MG 08/11/2011 08/11/2011 08/12/2011 08/12/2011 08/12/2011 08/12/2011 4 10:59 11:01 09:07 09:48 10:14

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To modify an administered medication, click directly on the medication. Then double click on any dark blue field to make fields changeable. You are then able to make a change. Remember you are able to change only the medication that you charted. The co sign function is still available if needed. Be sure to document why medication was changed and what is correct in the note.

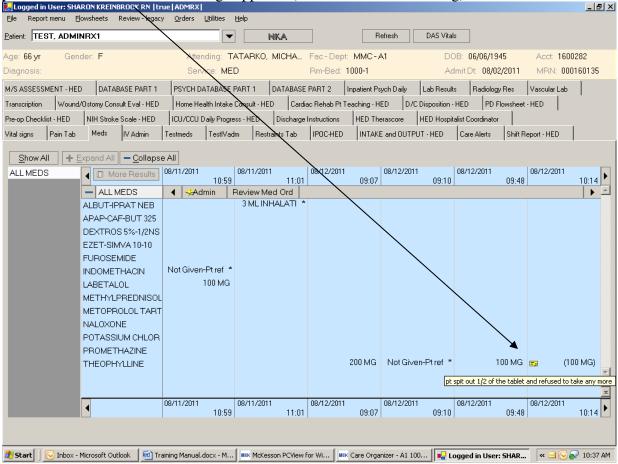
You can also use this function to complete an IV med. Document in the Admin note when the med completed and taken down (ie IV Gentamicin). If the nurse taking down the medication is different than the one who hung the med, you will enter your electronic signature by clicking cosign.

Then click save.



The medication is in parenthesis, designating that it has been modified. If you hover over the

yellow annotation box, the message appears. (Just like in HED charting)

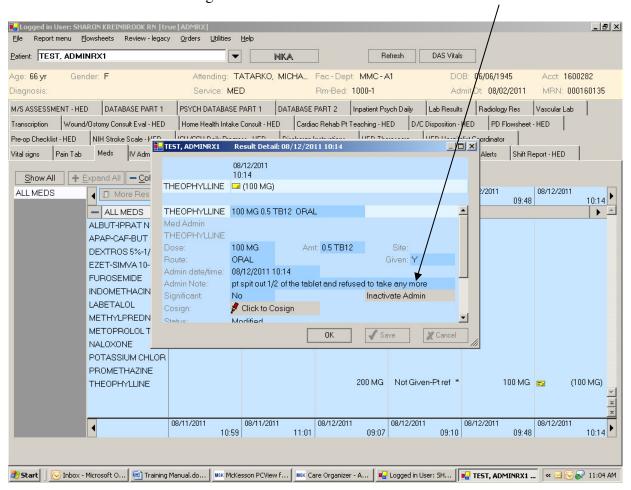


Inactivating a medication administration result:

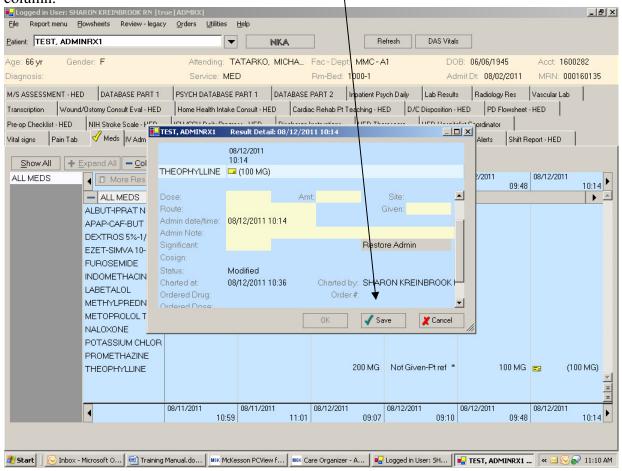
Do not inactivate the admission of an incorrect medication, follow the policy for medication errors.

Inactivation may be done only by the person who administered the med, within the allowable time frame, and if the end user has the security to inactivate.

Inactivation is always a 2 step process. First chart that it is not correct and why and save. Click on the result, click in the dark blue type a note that the administration was not done. Then save. Then click on the medication again and click on the Inactivate Admin button.



It will blank out the administration. Then click save. The medication will be removed from the column.

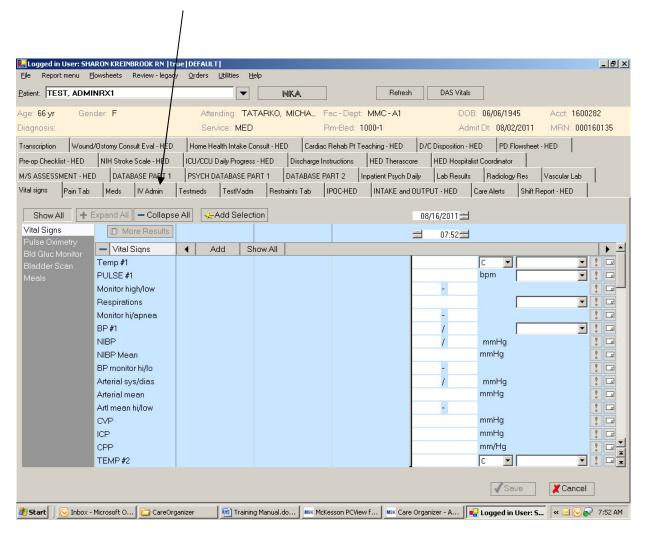


Remember that all modification and inactivation will be captured on the audit trail and will print to Patient folder at the time of discharge. It will also print when you print the Medication administration record for transfer to non automated unit, surgery, Interventiional radiology, or GI lab.

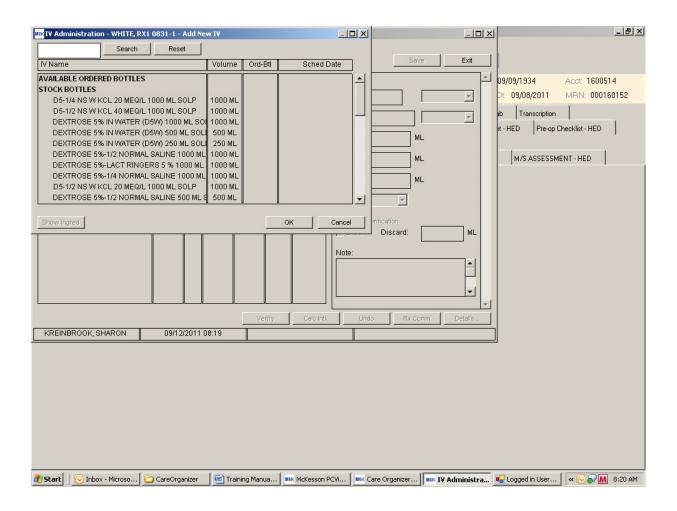
Clicking on the date and time box will not give you the option to inactivate the entire column. The inactivate option will be greyed out and unavailable for use.

Administer IV's, documenting in ADMINRX:

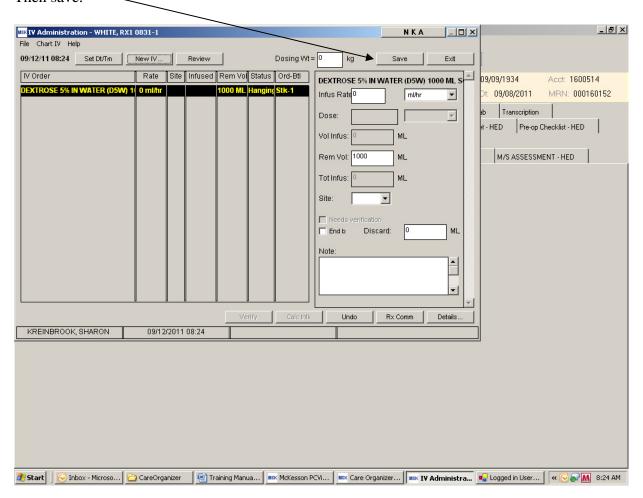
Click on the IV Admin tab.



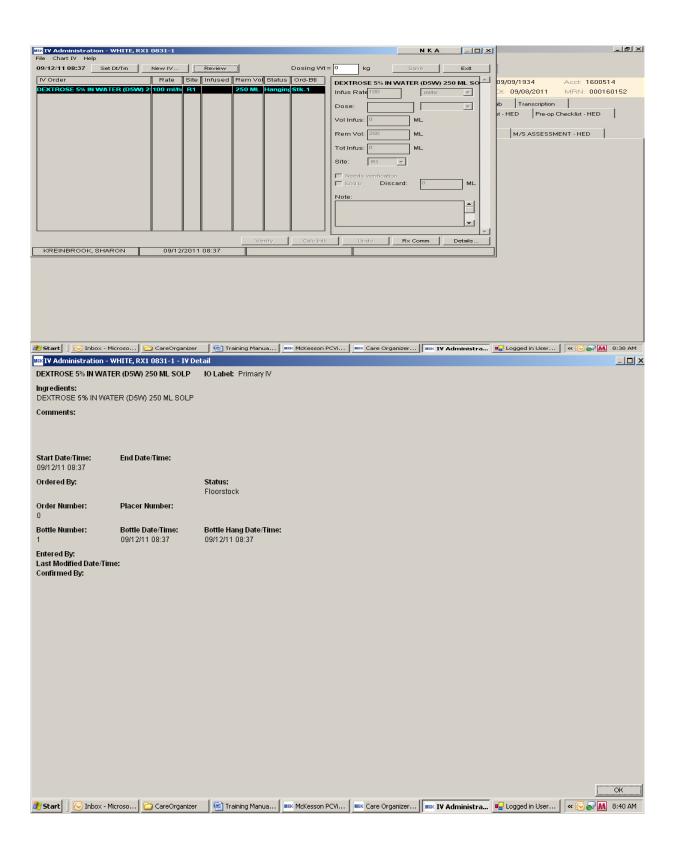
The IV administration screen will open. Click new IV's. If the IV's are entered by the pharmacy they will appear in the administration box. You will have the IV bag. Scan the bag to verify. You will also be able to select an IV from the stock bottle list or scan the IV bag from the stock IV's. The prefered method is to scan the bag.



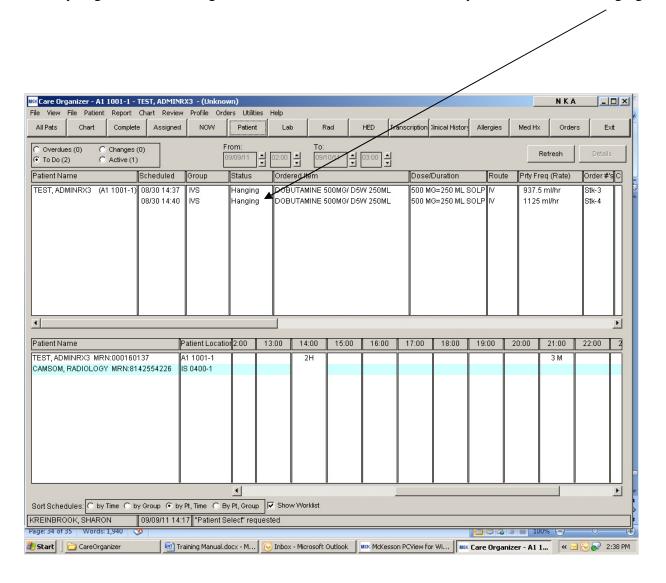
The selection will be yellow. Complete the administration screen for rate, and site and any other information you need to document. Remember you have the note box for additional comments. Then save.



After it is saved the IV will be blue. Double click on the IV to see the detail.



When you go back to care organizer, with the 'to do' button clicked, you will see the IV hanging.



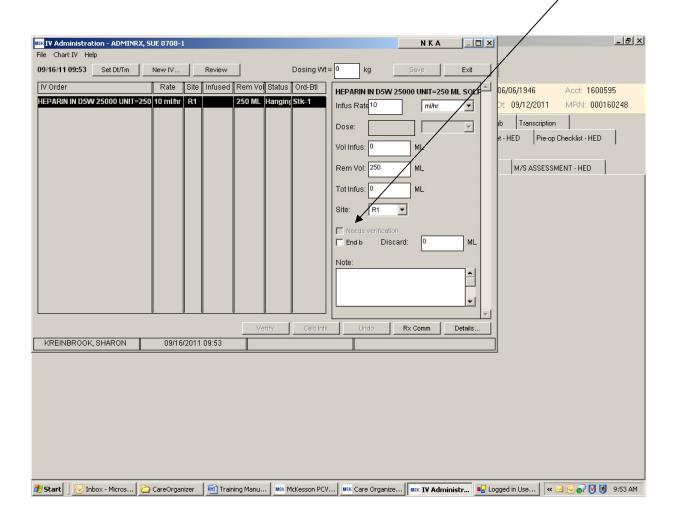
To end a bottle, click on the IV. Click end bottle. The amount disgarded will calculate according to time. If it is not the correct amount, correct it, and enter it into the I&O information. There is note space available for additional charting for each IV hung. _ B × File Chart IV Help Dosing Wt = 0 08/16/11 07:54 Set Dt/Tm New IV... Save Exit Rate Site Infused Rem Vol Status Ord-Btl IV Order 07/03/1956 Acct 1600284 D5-1/4 NS W KCL 20 MEQ/L 1000 ML SOLP LACTATED RINGERS 1000 ML 1000 ML Hanging 1-2 80 ml/hr NONE Infus Rate 100 MRN: 000160137 08/02/2011 ml/hr Warning: Hanging > 24 hours Vascular Lab D5-1/2 NS W KCL 20 MEQ/L 1001 I 100 ml/h 2 RW y Res 996 ML Hanging 3-1 Dose: v MVI, PEDI NO.1 WITH VIT K 1 VIA PD Flowsheet - HED THIAMINE HCL 100 MG Vo Infus: MI Warning: Hanging > 24 hours D5-1/4 NS W KCL 20 MEQ/L 1000 I 100 ml/hi R3 Rem Vol: 1000 Shift Report - HED MI Tot Infus: ML Site • Discard ML nd h Not -• □z mmHg nmHg KREINBROOK, SHARON 08/16/2011 07:54 Arterial sys/dias mmHg 1 mmHg · 🕝 Arterial mean : 🗔 Artl mean hi/low ! 🗔 mmHg CVP ICP mmHq CPP ____· ▼ ! □ <u>▼</u> TEMP#2 C 🔻

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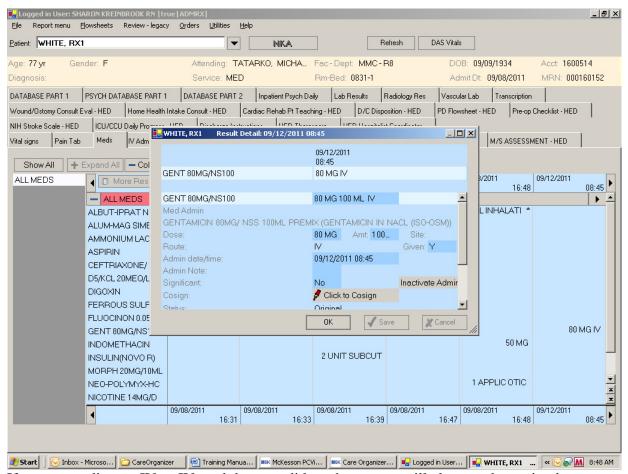
When hanging a weight based IV medication, the system will pull the weight from the admission. It will always use the admission weight. When you enter either the rate or dose, the system will calculate the other.

When hanging Heparin, the first RN will calculate the dose and hang the bottle and save. The second RN will sign on, select the patient, click on the heparin in the IV screen and verify the heparin dose in the note field. This will provide the electronic signature co sign required for heparin.

To change Heparin dose, click on the Heparin, change dosage, click on note to document if needed. Click Heparin again to activate the save button. Then click save.



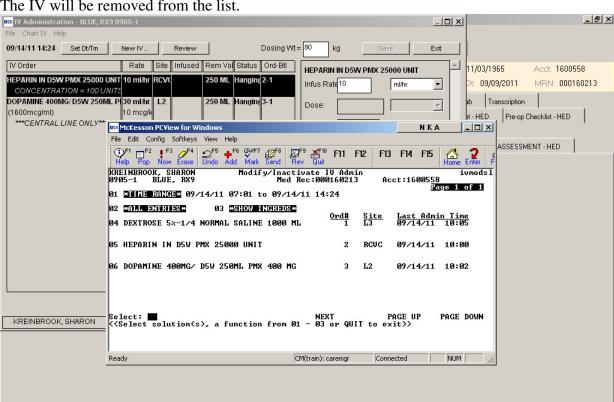
Other IV meds that show under the meds tab can be co signed by signing on, clicking directly on the med and clicking the co sign button providing the electronic signature.



If you are ending an IV or IV med that you did not hang, you will also use the cosign button. The system willl record the time in the background.

If you inadvertently selected the wrong bag you are able to inactivate the IV. But if you hang the wrong IV you must stop the bottle and complete the policy required information (SRM). To inactivate an IV:

- Highlight the IV
- Click chart IV
- Select Modify / inactivate
- Click beside the solution you want to inactivate
- Click next
- Click inactivate
- Click item to be inactivated
- Click send.



The IV will be removed from the list.

Print an e-mar:

Inbox - Micros...

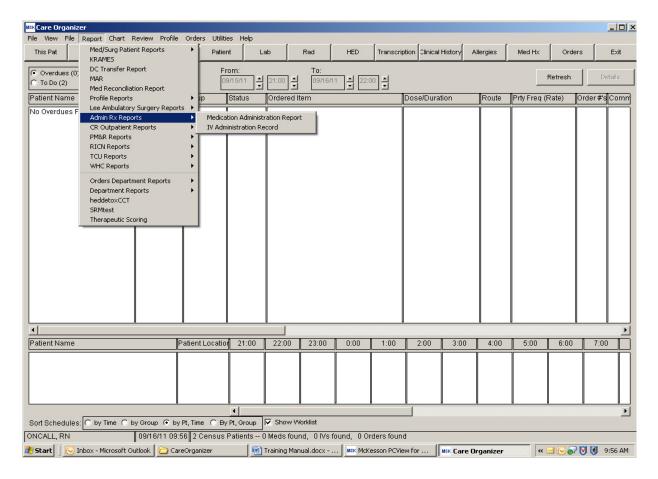
Under reports in care organizer click on reports, click on Admin RX reports, click on Medication administration report. A box will open showing the patients name, date range (change dates to capture needed time frames). Click no for permanent chart document and send. You will print an emar when a patient is being transferred to a non automated unit, surgery, interventional radiology, or GI lab.

CareOrganizer Training Manu... Mak McKesson PC... Mak Care Organize...

Under reports in care organizer click on AdminRX reports click on IV administration record to print an emar for IV's. Complete the opened box and click send.

Along with the e mar, a report of all modification and inactivation done in the medication aministration screen will print.

MSK IV Administrati... 🖳 Logged in User... | « 🖂 🕞 🔊 🚺 2:25 PM



Code Blues will continue to be done on paper.

Downtime:

Reports will be printed timely.

- Scheduled downtime MARS will print prior to downtime
- Unscheduled downtime MARSwill print after the downtime and be distributed to the units.
- Care manager down HMM will print MARS will have to document last dose
- HMM down will have a history in care manager but paper MARS will be instituted,
- All new meds will not be in the system.

Untethered scanners will be used and be placed in chargers on the carts. Please remember to keep the scanner with the same cart. The scanner from one cart will not work with another cart.

Keep carts plugged in when possible to ensure sufficient charging.

When a bar code will not scan:

Go to the med admin list and double click on the med to see the schedule. Select the admin med button. Scan the patient's wrist band, administer the med and confirm. Place the medication packaging in the designated area and notify one of the support staff (during live support) to

notify the pharmacy. Pharmacy or support staff will check to see if the bar code has been profiled. This should happen less often as we find all of the meds that may not have been profiled or have been added to the pharmacy. Eventuially the number of bar codes that will not scan will be few. Report them directly to the pharmacy.

Multidose vials (insulin) will be in the pyxis and have tadpole barcodes. Draw up the insulin add a tadpole barcode label to the syringe. When taken to the bedside scan the patient, scan the syringe, scan the patient, administer the insulin and confirm. Remember, insulin sliding scale coverage is a prn med.

Appendix D - NwHIN Conditional Acceptance

Page 1 of 1

John Hargreaves

From: Yeager, Mariann (OS/ONC) (CTR) [Mariann.Yeager@hhs.gov]

Sent: Tuesday, September 27, 2011 3:12 PM

To: Joe Dado; John Hargreaves

CC: Michael Matthews; vijay.shah@nitorgroup.com; vroberts@nationalehealth.org

Subject: Exchange Conditional Acceptance

Dear Joseph and John:

On September 26, 2011, the Exchange Coordinating Committee reviewed the validation testing results for Conemaugh Health System ("Conemaugh"). Based upon this information, we are pleased to notify you that Conemaugh has been conditionally accepted as a Participant in the Exchange.

This conditional acceptance requires that Conemaugh be ready to begin exchanging data in production using the validated services with another Exchange Participant no later than January 24, 2012. This is one hundred twenty (120) calendar days following the Coordinating Committee's conditional acceptance of your validation testing results.

As the Coordinating Committee Chair and on behalf of the Participants in the Exchange, I will countersign Conemaugh's DURSA Joinder Agreement, to take effect on the date you go into production as an Exchange Participant.

Please note that once the amended DURSA takes effect, Conemaugh will be required to sign the amended version. We will contact you with more details as the approval process progresses.

If, for any reason, Conemaugh is unable to go into production as an Exchange Participant by January 24, 2012, please notify your assigned ONC On Boarding Team representative and submit an extension request to the Coordinating Committee at onc.exchangeinfo@hhs.gov. The Coordinating Committee may accept or deny this extension request in accordance with its operating policies and procedures.

Conemaugh's formal acceptance as a Participant takes effect on the date Conemaugh's system is operational in a production environment, able to exchange data with other Participants, Conemaugh's DURSA Joinder Agreement is fully executed, and when Conemaugh's Digital Credentials are issued and Conemaugh is added to the Exchange service registry.

We do ask that you withhold announcements about your participation until your Participation goes into effect.

The following outlines next steps

- An on boarding team representative will issue Conemaugh its Production Digital Credentials once the outstanding issue is addressed and verified by the on boarding team.
- You will be asked to provide the on boarding team the required information to add Conemaugh to the Exchange service
 registry. The on boarding team will confirm that the information supplied is accurate by testing the information provided.
- The on boarding team will issue Conemaugh Digital Credentials in the production registry. At this point, Conemaugh becomes
 activated as a Participant in the Exchange, enabling other Participants to identify and begin exchanging health information with
 Conemaugh.

If you have any questions regarding this process, please do not hesitate to contact any of the individuals carbon copied on this letter.

Regards,

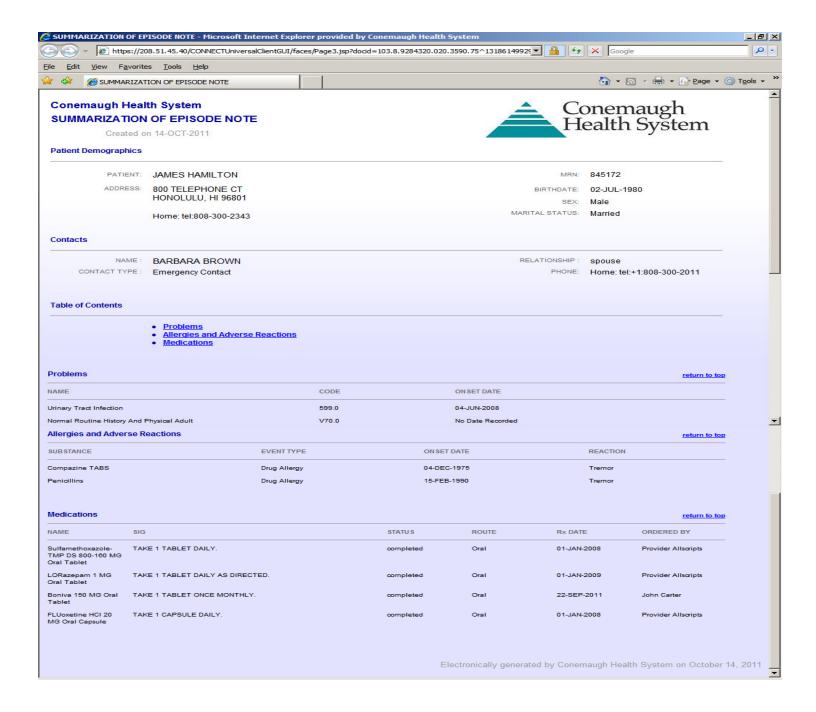
Mariann Yeager (Coordinating Committee Secretary) on behalf of:

Michael Matthews

Chair, Exchange Coordinating Committee

9/27/2011

Appendix E – Continuity of Care Document (C32)



Appendix F – Emergency Room Discharge Summary (C62)

